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Knowledge Value Added (KVA) methodology as a tool for measuring the utilization of knowledge assets aboard Marine Corps installations

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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

KNOWLEDGE VALUE ADDED (KVA) METHODOLOGY AS A TOOL FOR MEASURING THE UTILIZATION OF KNOWLEDGE ASSETS ABOARD MARINE CORPS INSTALLATIONS

by

Scott LaRocca

June 2008

Thesis Advisor:	Glenn Cook
Second Reader:	Thomas Housel

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        The past four Commandants of the Marine Corps have published their intent to adopt better business practices and transform business processes. The compelling urgency to ensure the Corps achieves optimal performance from its limited resources is supported by protracted global commitments, increasing labor and technology costs, and lawmaker and taxpayer demands for fiscal prudence.
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        Workforce optimization is central to the success of these efforts. Personnel productivity can be measured using knowledge as a common metric to determine value. Knowledge assets include people and the Information Technology systems that improve their abilities to perform their work.
        The Knowledge Value Added (KVA) methodology calculates Return on Knowledge (ROK) and utilization rates of knowledge assets. A case study is explored which uses KVA to measure ROK and utilization rates as a means to monitor and set benchmarks for optimal organizational performance in support of CPI programs.		

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KNOWLEDGE VALUE ADDED (KVA) METHODOLOGY AS A TOOL FOR MEASURING THE UTILIZATION OF KNOWLEDGE ASSETS ABOARD MARINE CORPS INSTALLATIONS

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY MANAGEMENT

from the

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ABSTRACT

The past four Commandants of the Marine Corps have published their intent (Appendix A) to adopt better business practices and transform business processes. The compelling urgency to ensure the Corps achieves optimal performance from its limited resources is supported by protracted global commitments, increasing labor and technology costs, and lawmaker and taxpayer demands for fiscal prudence.

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To my father, Edward LaRocca, for setting the most incredible example for a son to follow, for singing my praises to anyone who would listen, for making me want to work hard and treat others with respect, and for continuing to be my conscience as long as I walk the Earth.

To my beautiful bride, Michelle, for tolerating the constant pressure of being a Marine spouse as well as the pressure of this academic environment and how difficult it made me to live with at times, for being my candle in the wind, for sharing this wonderful journey of life with me, and for teaching me to appreciate every moment. Like everything else we have, My Love, this achievement was a joint effort.

I.   INTRODUCTION

The war in Iraq—an $11 billion-a-month endeavor involving 170,000 soldiers and 163,000 contract workers—is one unwieldy enterprise. The brass faces relentless pressures overseeing troops, managing outside employees, creating new war tactics, and dealing with tight budgets. So officials in Washington are sending top-rank officers to business schools to learn to think more like their corporate peers. (Porter, 2008)

A.   PROBLEM STATEMENT

For nearly two decades, dozens of federal regulations have been enacted which mandate government agency audit compliance for financial accounting systems (Budget of the U.S. Government, 2002).   In addition, agencies are required to submit annual financial performance measurement statistics to demonstrate prudent spending.   However, the public sector with its necessarily high standards, global commitments, scarce resources, and lengthy acquisition process, has fallen far behind the private sector with respect to leveraging modern performance measurement techniques for financial decision-making. The Knowledge Value Added (KVA) methodology is gaining in popularity as an analysis technique because of its flexibility and scalability to support public sector/non-profit operations (Appendix B).

The nation has generally accepted that the Marine Corps will defend America's freedom whenever called upon to do so, and expects that it will be as efficient and effective as possible. In this new age of ideological extremes, political discourse, complex and expanding military missions, and uncertain timelines and victory conditions, however, even the Marine Corps has to justify the cost of its actions.   Although it has tried many methods of performance measurement, the Marine Corps lacks a universal technique to measure the return value of its financial and human resource management decisions in relation to the objectives it pursues.

B.   RESEARCH OBJECTIVES

This thesis will demonstrate that the Marine Corps can measure its "bang-for-the-buck" more accurately than it is currently capable of doing, without sacrificing operational effectiveness. The Knowledge Value Added (KVA) methodology has proven itself to be a force enhancer in multiple military scenarios (Appendix B), but has yet to be widely tested as a viable methodology in the Marine Corps. The research contained herein will prove that, by using the cost and application of knowledge as a common unit of measure, the Marine Corps can improve the visibility and application of its financial and human resources, enabling more informed and efficient budgetary decisions, more accurate and meaningful performance benchmarking, and better personnel allocation and utilization.

This research will use the KVA methodology to establish and compare the financial return value of a standard process across multiple Marine Corps installations to demonstrate the benefit of KVA as an analysis technique and as a viable decision support tool. The installations will be compared to one another to uncover any patterns of knowledge use that might aid in resource allocation decision-making. The impact of IT support on process improvement and productivity will also be discussed.

To be clear, the ultimate value of this research is its confirmation that KVA can be used in conjunction with any IT solution on any process, and in concert with any ongoing initiatives to aid in producing a quantitative solution to justifying resource alignment with priorities.

C.   RESEARCH QUESTIONS

The thesis will attempt to answer the questions:

1 – How can the Marine Corps measure the return value of its critical processes?

2 – How can the Marine Corps make justifiable benchmark analyses in support of effective budgetary decisions and knowledge asset utilization?

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D. METHODOLOGY

This thesis will model the standard processes and related sub-processes of the Military Police (MP) community aboard Marine Corps installations. The KVA methodology will be used to establish baseline return values of these processes. The financial and human resource data used in this model will include actual Fiscal Year 2005 data collected from installation Business Performance Offices (BPO), as compiled by the Marine Corps Business Enterprise Office (MCBEO) in Washington, D.C. The results of the KVA analysis will be used to draw conclusions as to the usefulness of the KVA methodology as a decision support tool that supports current techniques of process improvement in the public sector in general and in the Marine Corps specifically.

E. SCOPE

This research is primarily for the benefit of the Marine Corps Business Enterprise Office (MCBEO), but its results can be expanded and interpreted by a much larger audience. Any public sector organization seeking a common performance measurement method, especially those who need to consider the impact of IT solutions on their current processes, can use this thesis to make more effective resource management decisions.

The scope of the documentation will include applicable laws, policies, plans and initiatives that govern and enable the appropriate and efficient use of financial and knowledge capital resources aboard Marine Corps installations. The range of tools and techniques to be studied includes the historical and current methodologies employed by the Marine Corps, the systems from which financial data is drawn, the manner in which the data is analyzed, and the end users intended to benefit from the data.

F. ORGANIZATION OF THESIS

This thesis will be organized in the following manner:

Chapter I provides an overview of the larger problem domain, the specific scope of the problem addressed, the research questions that will be answered in this thesis, and the methodology and organization used to conduct the research.

Chapter II contains a detailed review of the pertinent literature to the problem domain and elaborates on the methods the Marine Corps has explored and is currently using to improve its financial management and performance measurement capabilities in support of effective and optimal resource management decisions.

Chapter III is a discussion on the concepts of knowledge, knowledge assets, and utilization rates. The KVA model built for this research is also explained in detail.

Chapter IV is a proof-of-concept KVA analysis case study on the Military Police (MP) community aboard Marine Corps installations. One installation is explored in detail using the KVA model from Chapter III, and the findings on Utilization Rate, Return on Knowledge (ROK), and Daily Cost are presented and analyzed in the larger context of the entire Marine Corps.

Chapter V presents relevant conclusions from the findings developed in Chapter IV. The research questions from Chapter I are also re-addressed and recommendations are made to the Marine Corps financial management and analysis community to improve decision making and benchmarking. Follow-on research suggestions are also explored in this chapter.

II. LITERATURE REVIEW

The Marine Corps is a combat force, not a business. To be successful, however, we need to support warfighting excellence with well-managed business processes that are both effective and efficient. The Secretary of Defense and Secretary of the Navy have emphasized, and the Marine Corps is committed to, business transformation in order to optimize resource allocation... The Marine Corps will continue to refine our business practices and increase the effectiveness of warfighting potential.

— Gen Michael W. Hagee, 33rd Commandant of the Marine Corps

A. PERTINENT LAWS AND STATUTES

The following documents, listed in chronological order, have defined and shaped the boundaries of the problem domain over the past two-plus decades. They serve as the impetus for all political change and compliance enforcement in the realm of financial management issues affecting resource management in the public sector.

Gramm-Rudman-Hollings Balanced Budget and Emergency Deficit Control Act of 1985.

The Balanced Budget and Emergency Deficit Control Act of 1985 was designed to end deficit spending. It set annual deficit targets for five years, declining to a balanced budget in 1991. If necessary, it required across-the-board cuts in programs to comply with the deficit targets (Budget of the U.S. Government, 2002).

Budget Enforcement Act of 1990. The Budget Enforcement Act was enacted in 1990 in an effort to control future budgetary actions. It did this through two separate, but related, mechanisms: limits on discretionary spending, and the pay-as-you-go process to require that any legislative action on direct spending or revenues which would increase the deficit be offset. These procedures currently would apply through FY2002 (for legislation enacted before October 1, 2002, for measures affecting direct spending or revenues), regardless of whether the budget is in deficit or surplus (Saturno, 1998).

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Chief Financial Officer's Act of 1991. The CFO Act will lay a foundation for comprehensive reform of federal financial management. The act establishes a leadership structure, provides for long-range planning, requires audited financial statements, and strengthens accountability reporting. Federal financial managers, auditors, and program managers at all levels of government will be affected as agencies take actions required under the CFO Act to improve financial management systems and information (GAO, 1991).

Government Performance Results Act (GPRA) of 1993. The purposes of this Act are to:

- improve the confidence of the American people in the capability of the Federal Government, by systematically holding Federal agencies accountable for achieving program results;
- initiate program performance reform with a series of pilot projects in setting program goals, measuring program performance against those goals, and reporting publicly on their progress;
- improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction;
- help Federal managers improve service delivery, by requiring that they plan for meeting program objectives and by providing them with information about program results and service quality;
- improve congressional decision making by providing more objective information on achieving statutory objectives, and on the relative effectiveness and efficiency of Federal programs and spending; and
- improve internal management of the Federal Government. (National Partnership for Reinventing Government, 2001)

Statement of Federal Financial Accounting Standards #4 of 1995.

The managerial cost accounting concepts and standards contained in this statement are aimed at providing reliable and timely information on the full cost of federal programs, their activities, and outputs. The cost information can be used by the Congress and federal executives in making decisions about allocating federal resources, authorizing and modifying programs, and evaluating program performance. The cost information can also be used by

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program managers in making managerial decisions to improve operating economy and efficiency. (Federal Accounting Standards Advisory Board, 1995).

Information Technology Management Reform (Clinger-Cohen) Act of 1996. The "Clinger-Cohen Act (CCA) of 1996 provides that the government information technology shop be operated exactly as an efficient and profitable business would be operated. Acquisition, planning and management of technology must be treated as a 'capital investment'" (U.S. Department of Education, n.d.).

Management Initiative Decision 901: Establishing Performance Outcomes and Tracking Performance Results (2002). MID 901:

> requires OSD establish a framework for executive-level performance goals and tracking results. This MID shifts the department's focus to outcome results and aligns us to the 2001 QDR Risk Management framework. MID 901 assigns responsibility for refining and cascading performance metrics to the component level and requires each component appoint a GO/SES level Performance Management Coordinator (PMC) (MID 901, 2002).

Management Initiative Decision 910): Budget and Performance Integration Initiative (2002). OSD released MID 901 along with MID 910.

> MID 910 expands the President's Management Agenda initiative on Budget and Performance Integration. MID 910 reinforces the effort to cascade responsibility for implementing the President's Executive Scorecard on the Budget and Performance Integration to the Components.. Each Component will be "graded" on its status and progress in:
>
> - Displaying the linkage of plans-outputs-resources in budget justification materials.
> - Expanding the treatment of metrics in the FY2004 congressional justification materials.
> - Establishing a quarterly system reporting on progress towards performance goals. (MID 910, 2002)

B.   RELEVANT POLICIES TO MARINE CORPS INSTALLATIONS

The following unclassified regulations and policies are listed in chain-of-command descending order, each providing increasingly more detailed guidance on financial performance measurement aboard Marine Corps installations:

President's Management Agenda (PMA) of 2001.   The PMA "is a bold strategy for improving the management and performance of the federal government. The Agenda contains five government-wide and nine agency-specific goals to improve federal management and deliver results that matter to the American people" (U.S. Government, 2001). Its five government goals include:

- Strategic Management of Human Capital
- Competitive Sourcing
- Improved Financial Performance
- Expanded Electronic Government
- Budget and Performance Integration

Its nine agency-specific goals are:

- Faith-based and Community Initiatives,
- Privatization of Military Housing,
- Better Research and Development Investment Criteria,
- Elimination of Fraud and Error in Student Aid Programs and Deficiencies in Financial Management,
- Housing and Urban Development Management and Performance,
- Broadened Health Insurance Coverage through State Initiatives,
- A "Right-Sized" Overseas Presence,
- Reform of Food Aid Programs,
- Coordination of Veteran's Affairs and Defense Programs and Systems.

National Security Strategy (NSS) of 2002. The NSS defined America's security situation, posture, and plan for success in the post-911 era.   The following concepts (National Security Strategy of the United States, 2002) laid the groundwork for the subsequent 2004 National Military Strategy (NMS):

- Champion Aspirations for Human Dignity
- Strengthen Alliances to Defeat Global Terrorism and Work to Prevent Attacks Against Us and Our Friends
- Work with others to Defuse Regional Conflicts

- Prevent Our Enemies from Threatening Us, Our Allies, and Our Friends with Weapons of Mass Destruction
- Ignite a New Era of Global Economic Growth through Free Markets and Free Trade
- Expand the Circle of Development by Opening Societies and Building the Infrastructure of Democracy
- Develop Agendas for Cooperative Action with the Other Main Centers of Global Power
- Transform America's National Security Institutions to Meet the Challenges and Opportunities of the Twenty-First Century

National Military Strategy (NMS) of 2004. "The NMS provides focus for military activities by defining a set of interrelated military objectives from which the Service Chiefs and combatant commanders identify desired capabilities and against which (Chairman, Joints Chiefs of Staff) CJCS assesses risk" (National Military Strategy of the United States, 2004). The NMS identified key aspects of the security environment and discussed appropriate force size and composition. It also identified three military objectives:

- Protect the United States Against External Attacks and Aggression
- Prevent Conflict and Surprise Attack
- Prevail Against Adversaries

Quadrennial Defense Review of 2006. "This QDR defines two fundamental imperatives for the Department of Defense (Quadrennial Defense Review Report, 2006, p.1):

- Continuing to reorient the Department's capabilities and forces to be more agile in this time of war, to prepare for wider asymmetric challenges and to hedge against uncertainty over the next 20 years.
- Implementing enterprise-wide changes to ensure that organizational structures, processes and procedures effectively support its strategic direction.

Defense Installation Strategic Plan, 2007.

The 2007 Defense Installations Strategic Plan reflects the continuous evolution of the strategic planning process. As part of the President's Management Agenda, Executive Order 13327, 'Federal Real Property Asset Management,' promotes efficient and economical use of real property assets. The Federal Real Property Council, created by the executive order, issued guiding principles, vision, and performance measures which are incorporated in our processes and practices. The 2006 Quadrennial Defense Review

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(QDR) directs the implementation of enterprise-wide changes to ensure that organizational structures, processes and procedures effectively support DoD's strategic direction (Defense Installations Strategic Plan, 2007, p.4).

DoN Objectives. These annual statements from the Secretary of the Navy identify the Department's top priorities each fiscal year. For the last three years, the DoN Objectives have outlined provided strong focus on optimizing the workforce and managing "risk to improve mission effectiveness and safeguard the people and resources of the Navy-Marine Corps Team" (Hagee, M., Mullen, M., and Winter, D., 2006; Hagee et al., 2007; Conway, J., Roughead, G. and Winter, D., 2007).

Naval Power 21, Oct 2002. Signed by the Secretary of the Navy, The Honorable Gordon England, Chief of Naval Operations, ADM Vern Clark, and Commandant of the Marine Corps, Gen James L. Jones, this visionary document for the 21st century declares that the Navy-Marine Corps team's

> top business priority is identifying and increasing the resources available to grow and sustain Naval Force core combat capabilities. We will eliminate non-core functions that unnecessarily compete for resources. We will improve business practices to achieve end-to-end capabilities in the most economical manner. These business practices will focus on continuous process improvement with metrics for measurement and evaluation. Resources will not be expended that do not support the capabilities and objectives identified in this vision (Naval Power 21, 2002, p.3).

Marine Corps Strategy 21. This strategy contains three goals to achieve its vision of being the "premier expeditionary total force in readiness," one of which is "to optimize the Corps' operating forces, support and sustainment base, and unique capabilities to respond to the complex spectrum of crises and conflicts" (Marine Corps Strategy 21, 2000, p.7).

Marine Corps Installations 2020 (2001). This vision document focuses specifically on the mission of the garrison supporting establishments and serves to "provide a common vision for our bases and stations to keep pace with force

modernization and changing operational requirements outlined in Marine Corps Strategy 21" (Marine Corps Installations Strategic Plan, 2004).

Marine Corps Installations Strategic Plan (2004). This document is "a six-year road map, working toward achieving the Installations 2020 vision" (Marine Corps Installations Strategic Plan, 2004). It clarifies the role of Marine Corps installations as the ""fifth element" of the Marine Air Ground Task Forces (MAGTFs) because of their close and critical link to the operating forces. Installations must transition in step with the warfighters' changing requirements. By diligently pursuing the enclosed installation goals, strategies, measures, and performance targets, our bases and stations will be poised to meet the needs of the warfighter in the 21st century" (Marine Corps Installations Strategic Plan, 2004).

Commandant's White Letter, Jan '98: Better Business Practices. This personal communication from Gen Charles C. Krulak, 31st Commandant of the Marine Corps, declared to all General Officers, Commanding Officers, and Officers-in-Charge that

> leading the Marine Corps into the 21st Century demands that we embrace a *revolution in business affairs.* This revolution has transformed the way private sector businesses operate by minimizing overhead, reducing costs, and increasing responsiveness. The Marine Corps must d the same. The reality of constrained resources, personnel cuts required in the Quadrennial Defense Review, and overhead reductions mandated by the Defense Reform Inititative requires that we aggressively seek greater efficiencies. To do less risks cuts in the operating forces and falling behind the demands of 21st Century warfare (CMC White Letter 2-98, 1998).

Commandant's White Letter, Sep '04: Transforming Our Business Processes. This personal communication from Gen Michael W. Hagee, 33rd Commandant of the Marine Corps, directed all General Officers, Commanding Officers, and Officers-in-Charge to "take bold, informed actions that transform the way we conduct our business operations to both maximize prudent use of our

resources and to free to free up resources to fund future Marine Air Ground Task Force (MAGTF) capabilities" (CMC White Letter 06-04, 2004).

Marine Corps Business Enterprise (MCBE) Strategic Plan, 3 Nov 2004. "This plan sets forth strategy, principles, measures, and action guidance to achieve end-to-end assessment and improvement of our business processes" (MCBE Strategic Plan, 2004, Introduction). This plan replaced the initial USMC Business Plan of 14 July 2000, which called for a "plan to identify and implement organizational, structural, and personnel (civilian and military) changes necessary to sustain best business practices" (Official ACMC message, 2002).

Establishment of USMC Installation Business Performance Offices (BPO), April 2002. This Assistant Commandant-released message formally announced the structure and mission of the installation BPO's. This formal establishment represented the accomplishment of the plan mandated by the USMC Business Plan. (Official ACMC message, 2002).

C. APPLICABLE GAO REPORTS

The U.S. Government Accountability Office (GAO) serves as the taxpayer's watchdog. GAO reports (GAO Reports, 1995-2007) provide impartial analyses on all aspects of Government operations. The reports in Figure 1 exhibit a number of common themes relevant to this research, including Financial Accountability, Performance Measurement, Risk Management, Opportunities, and Sustained Leadership.

Mar 1998: Defense Management, Challenges Facing DoD in Implementing Defense Reform Initiatives: Military Readiness

Nov 1995: Financial Management, Challenges Facing DoD in Meeting the Goals of the Chief Financial Officers Act

Mar 2000: Managing in the New Millennium, Shaping a More Efficient and Effective Government for the 21st Century

Jan 2002: Managing For Results, Agency Progress in Linking Performance Plans With Budgets and Financial Statements

Apr 2005: DoD Business Systems Modernization, Billions Being Invested without Adequate Oversight

Jan 2003: Defense Budget, Improved Reviews Needed to Ensure Better Management of Obligated Funds

Aug 2006: Department of Defense: Sustained Leadership Is Critical to Effective Financial and Business Management Transformation

Mar 2007: Federal Financial Management, Critical Accountability and Fiscal Stewardship Challenges Facing Our Nation

May 2007: Business Systems Modernization: DoD Needs to Fully Define Policies and Procedures for Institutionally Managing Investments

Mar 1997: Performance Budgeting, Past Initiatives Offer Insights for GPRA Implementation

Apr 1999: Performance Budgeting, Initial Experiences Under the Results Act in Linking Plans With Budgets

Feb 2005: Performance Budgeting, Efforts to Restructure Budgets to Better Align Resources with Performance

Jun 2005: 21st Century Challenges, Performance Budgeting Could Help Promote Necessary Reexamination

1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007

Apr 1996: Military Bases, Opportunities for Savings in Installation Support Costs Are Being Missed

Mar 1998: Defense Infrastructure, Challenges Facing DoD in Implementing Reform Initiatives: Military Installations and Facilities

Aug 2001: Request for Views, Results-Oriented Budget Practices in Federal Agencies

Dec 2003: Military Readiness, DoD Needs to Reassess Program Strategy, Funding Priorities, and Risks for Selected Equipment

Jun 2005: Defense Infrastructure, Issues Need to Be Addressed in Managing and Funding Base Operations and Facilities Support

Nov 2006: Defense Business Transformation, A Comprehensive Plan, Integrated Efforts, and Sustained Leadership Are Needed to Assure Success

Apr 1997: GPRA, Managerial Accountability and Flexibility Pilot Did Not Work as Intended

Feb 2000: Defense Budget, DoD Should Further Improve Visibility and Accountability of O&M Fund Movements

Feb 2002: Defense Acquisitions, DoD Faces Challenges in Implementing Best Practices

May 2004: Defense Business Systems Modernization, Billions Continue to Be Invested with Inadequate Management Oversight and Accountability

Jun 2005: DoD Business Transformation, Sustained Leadership Needed to Address Long-standing Financial and Business Management Problems

Jun 2007: Financial Regulators, Agencies Have Implemented Key Performance Management Practices, but Opportunities for Improvement Exist

Sep 2007:
Quadrennial Defense Review: Future Reviews Could Benefit from Improved DoD Analyses and Changes to Legislative Requirements

Sep 2007:
Defense Business Transformation: Achieving Success Requires a Chief Management Officer to Provide Focus and Sustained Leadership

Oct 2007:
Defense Business Transformation: A Full-time Chief Management Officer with a Term Appointment Is Needed at DoD to Maintain Continuity of Effort and Achieve Sustainable Success

Dec 2007:
Military Base Realignments and Closures: Cost Estimates Have Increased and Are Likely to Continue to Evolve

Figure 1.   Business Transformation-related GAO Report Timeline.

1.   Financial Accountability

In many reports, GAO stresses poor visibility of funds as a major cause of financial mismanagement. On page 1 of its November 1995 report, GAO discusses DoD's efforts to implement the CFO Act, stating that DoD

> does not yet have adequate financial management processes in
> place to produce the information it needs to support its decision-

making process. No military service or other major DoD component has been able to withstand the scrutiny of an independent financial statement audit.

Similar statements and numerous examples of poor visibility of funds in were cited in subsequent years, such as in the January 2003 report: "The Navy did not know how much money was tied up in unliquidated operating obligations that could potentially be used for other appropriate needs, and its budgetary reports to Congress and financial statements were inaccurate."

In February 2005, GAO stated, on page 5,

DoD reported over 200 inventory systems and 450 personnel systems. DoD's fundamentally flawed business systems affect mission effectiveness and can contribute to the fraud, waste, and abuse that GAO continues to identify.

Additionally, in the opening statement of its April 2005, the report determined,

DoD still does not have an effective department-wide management structure for controlling business systems investments. Furthermore, DoD is not in compliance with the National Defense Authorization Act for Fiscal Year 2003, which requires the DoD Comptroller to determine that system improvements with obligations exceeding $1 million meet the criteria specified in the act.

2.   Performance Measurement

Many of the GAO reports listed in Figure 1 suggest that identifying financially-supportable strategic goals is a critical prerequisite to fiscal prudence, operational success, and resource optimization. Tying plans to budgets is a frequent GAO recommendation, such as in the first paragraph of its March 1997 report, pointing out that several initiatives have "failed to shift the focus of the federal budget process from its longstanding concentration on the items of government spending to the results of its programs."

Two years later, in April 1999, GAO reported on page 2 that

although most agencies reviewed (30 of 35) defined some type of relationship between the program activities of their proposed

budgets and the performance goals of their plans, far fewer (14 or 40 percent of the plans reviewed) translated these relationships into budgetary terms—that is, most plans did not explain how funding would be allocated to achieve performance goals.

After another two years, at the request of many heads of departments and agencies requested specific solutions from GAO to aid in improving performance measurement. As a result, page 1 of GAO's August 2001 report describes "a framework for agency budget practices that can help guide an agency toward incorporating performance information into the budget process." GAO would continue to use this report as an unofficial grading benchmark in subsequent reports.

Recently, GAO reported on page 3 of its March 2007 report that

DoD needs to (1) develop and implement a viable strategic plan with goals, objectives, key milestones, and measures to monitor and report on progress in transforming its key business operations, and (2) establish a chief management officer to oversee its overall business transformation efforts.

3.   Risk Management

In many of its reports, GAO urges DoD to weigh mission costs against associated calculated risks and routinely recommends improvement in risk management capabilities. Secretary of the Navy Donald Winter supports this theme in his annual DoN objectives (Hagee, Mullen, and Winter, 2006; Conway, Roughead, and Winter 2007): "Establish a corporate risk management and mitigation strategy and ensure that Department leaders and managers use risk-based approaches for planning and problem-solving."

The roots of this theme go back to GAO's March 1998 report, which stated on page 2, "DoD's plans to reduce out-year budgets before the magnitude of savings are clearly known is not without risk. This risk is that operating units and field commanders will not have sufficient funds to meet their readiness needs."

Continuing in this vein five years later, GAO reiterated the importance of risk management on page 12 of its December 2003 report, stating that,

DoD recognized that the older equipment items critical to DoD's ability to defeat current threats must be sustained as transformation occurs. DoD also recognizes that recapitalization of all elements of U.S. forces since the end of the Cold War has been delayed for too long.

This report recommended that DoD reassess its program strategies, funding priorities, and risks for selected equipment.

In the opening sentence of it September 2007 report, GAO stated,

While DoD's approach and methodology for the 2006 QDR had several strengths, several weaknesses significantly limited the review's usefulness in addressing force structure, personnel requirements, and risk associated with executing the national defense strategy.

4.   Opportunities

GAO frequently identifies many opportunities in its reports, and points out when DoD succeeds or fails to take advantage of them. On page 1 of its April 1996 report, GAO stated "consolidating and eliminating duplicate support services for military bases located close to one another, or where similar functions are performed at multiple locations." Nearly two years later, in its March 1998 report, GAO stated on page 3 that "significant opportunities exist to achieve savings from DRI consolidation, restructuring, and regionalization initiatives. DoD has not been able to fully capitalize on the potential offered by these initiatives."

In its March 2000 report on managing in the new millennium, GAO stated on page 1 that the Federal Government now has:

an opportunity and obligation to take a comprehensive look at what government should be doing and how it does it. Future fiscal challenges call for prudent stewardship of our national government to ensure delivery of the services that Americans want, need and can afford.

Last year, GAO observed in its June 2007 report that,

Federal financial regulators have implemented key practices for effective performance management systems in ways that consider the unique needs of their organizational cultures and structures, but

some have opportunities to improve implementation of certain practices as they continue to refine their systems.

5. Sustained Leadership

Over the course of the last three years, a new theme has been prevalent in GAO reports, on which endorses the need for sustained leadership in support of business transformation. In its June 2005 report on DoD Business Transformation, GAO states on page 2:

> This year, we added DoD's overall approach to business transformation to our high-risk list because DoD lacks a strategic and integrated business transformation plan and because we have concerns over DoD's lack of adequate management responsibility and accountability to achieve and sustain business reform on a broad, strategic, department-wide, and integrated basis.

Continuing on this trend the following year, GAO reiterated in its opening statement of its August 2006 report,

> First, DoD should develop and implement a comprehensive, integrated, and enterprise-wide business transformation plan. Second, GAO continues to support the creation of a chief management officer, with the right skills and at the right level within the department, to provide the needed sustained leadership to oversee the department's overall business transformation process. Second, GAO continues to support the creation of a chief management officer, with the right skills and at the right level within the department, to provide the needed sustained leadership to oversee the department's overall business transformation process.

This theme continues to appear in many reports since 2006. As recently as October 2007, GAO declares in its opening statement that,

> DoD has yet to establish (1) a strategic planning process that results in a comprehensive, integrated, and enterprise-wide plan or set of plans to help guide transformation and (2) a senior official who can provide full-time attention and sustained leadership to the overall business transformation effort.

D. ACTIVITY BASED COSTING/MANAGEMENT (ABC/M)

The Marine Corps's strongest historical initiative to measure organizational performance and efficient use of resources was its ABC/M

Program. ABC was developed in the late 1980s by the Consortium for Advanced Manufacturing-International (CAM-I), and later made popular in business books and articles by Robert S. Kaplan. The concept behind ABC is to establish a cause and effect relationship between personnel and the activities they perform, as opposed to traditional costing methods which allocate costs based on where in the organization the personnel work. Once activity costs are known, activities are linked to the products and services (or Tasks, to which they will henceforth be referred) they generate and unit costs are identified (e.g., the cost to produce one more product). Overhead costs (costs to maintain the organization) are also identified and are targeted for resource reallocation or process improvement.

In 1999, the Marine Corps Business Enterprise Office (MCBEO) began experimenting with ABC/M as a means to improve financial visibility and cost allocation in the Marine Corps. In July 2003, ABC/M was officially adopted as the Marine Corps's official cost and performance measurement program (MARADMIN 320/03, 2003). Garrison installations were targeted because their operating costs are relatively static from year to year and their operating budgets and overhead costs are significantly higher than deployable, operating forces, presenting more possibilities for cost reduction and process improvement. Funding was approved by the Assistant Commandant of the Marine Corps to establish an ABC Program at every base and station, and personnel were assigned to capture relevant cost and performance data in a model and forward it to MCBEO for analysis each year. As the program grew and business-savvy leaders recognized the need for additional business expertise to support local commanders, Business Performance Offices (BPO) were created at each installation, which assumed responsibility for the ABC Program (Appendix A).

Over the next four fiscal years, the MCBEO and the BPO's continued to establish and refine relevant installation performance standards and metrics, and automate the population of the installation ABC models to facilitate analysis. In 2005, the ABC program was tied more closely to the Standard Accounting Budgeting Reporting System (SABRS) for standardization, automation and analysis purposes.

Despite robust efforts to automate the collection of data from the accounting system, however, the amount of manpower expended to collect non-automated activity data and to develop meaningful units of measure for every Task simply became overwhelming in light of support for increased operational tempo and global commitments. The Marine Corps subsequently suspended its ABC Program to pursue more efficient methods of performance measurement and cost reduction (see sections E and F below). (G. Heaivilin, personal communication, March 3, 2008)

E. CONTINUOUS PROCESS IMPROVEMENT (CPI)

In May 2006, the Secretary of Defense published the DoD CPI Guidebook, which describes the DoD CPI framework as "a strategic approach for developing a culture of continuous improvement in the areas of reliability, process cycle times, costs in terms of less total resource consumption, quality, and productivity." The Guidebook advocates the use of Value Stream Analysis and Mapping, Theory of Constraints and Lean Six Sigma techniques to foster this culture. "A value stream encompasses all the planning, execution, products, and services that go into a process to create value for a customer" (DoD CPI Guidebook, 2006). Figure 2 displays the core value streams in DoD.

The 2008 DoN Objectives call "for the acceleration of Lean Six Sigma (LSS) integration across the DoN in order to develop a culture of continuous improvement" (Appendix A). In January 2008, the Commandant of the Marine Corps issued the Continuous Process Improvement (CPI) Implementation policy (Appendix A), which announces a pending Marine Corps Order mandating the use of CPI tools and techniques in concert with DoD and DoN policy. The policy further establishes nine High Impact Core Value Streams (HICVS), "strategic processes that support combat readiness and the warfighter," intended to focus CPI efforts towards the top priorities in the Marine Corps:

- Acquisition
- Aviation Material Life Cycle Management (AIRSPEED)
- Capability Development
- Human Resources Development

- Information Technology
- Installation Management
- Resource Allocation
- Service Advocacy
- Total Life Cycle Management (Ground)
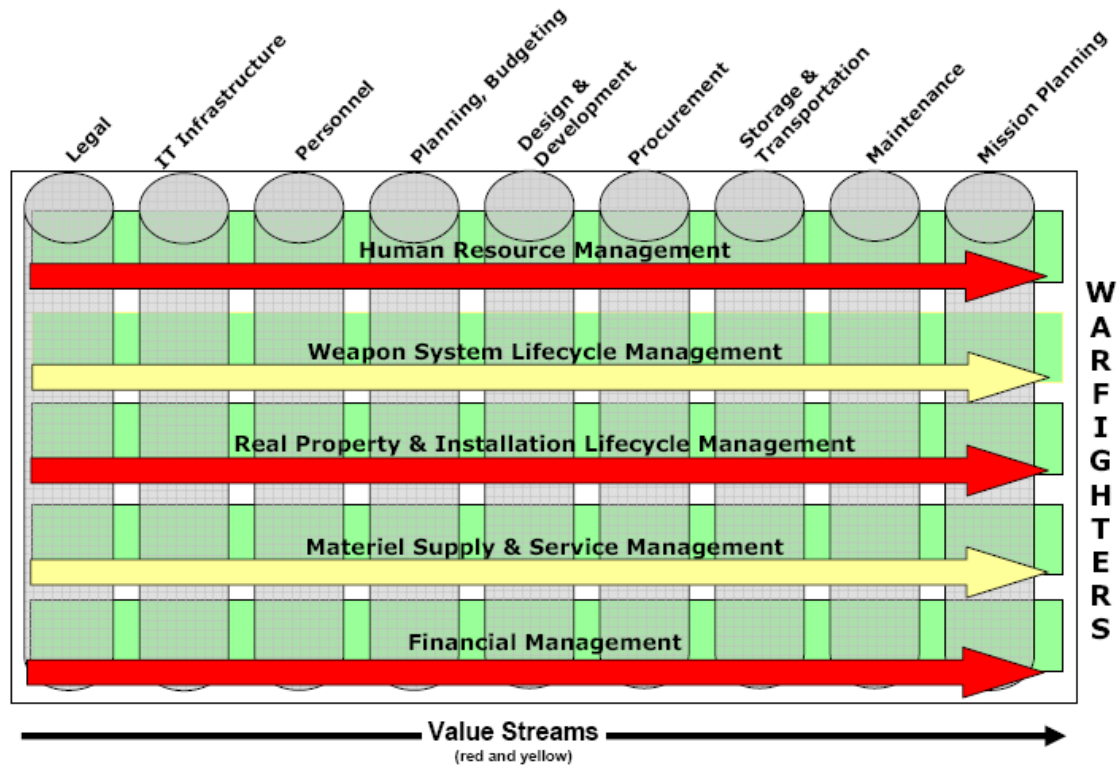
Figure 2.   Value Streams and the DoD Enterprise.

F.   LEAN SIX SIGMA

According to Six Sigma Systems, Inc., lean manufacturing is:

a proven approach to reduce waste and streamline operations. Lean manufacturing embraces a philosophy of continually increasing the proportion of value added activity of their business through ongoing waste elimination. A lean manufacturing approach provides companies with tools to survive in a global market that demands higher quality, faster delivery and lower prices (Six Sigma Systems, n.d.).

Six Sigma Systems, Inc. defines Six Sigma as "a philosophy of doing business with a focus on eliminating defects through fundamental process knowledge. Six sigma methods integrate principles of business, statistics and

engineering to achieve tangible results" (Six Sigma Systems, n.d.).   Sigma is the Greek letter used in statistics to denote variance from a mean in a normally-distributed population (often referred to as a bell curve). One standard deviation, or one sigma, of variance encompasses approximately 68.2% of a population. Six sigma includes over 99.9999998% of all members of a population (Tennant, 2001). In the Six Sigma process improvement method, the goal is to achieve an efficiency rate of six sigma. Stated another way, the goal is to eliminate six sigma worth of defects.

The concepts of Lean and Six Sigma have been combined to formulate a versatile performance improvement methodology that can be applied to any measurable process. When combined into a single methodology, Lean Six Sigma (LSS) provides a method for process improvement, focusing on removing barriers and non-value added process steps, thus providing better support to the people doing the work (LeValley & Fairclough, 2007, p. 4).

One of the appealing aspects of LSS is its personal recognition system, which is patterned after a martial arts program by awarding achievements with colored belts for successful cost-saving projects. With its growing success, LSS has been aggressively adopted over the last three years by DoD, DoN, and the Marine Corps as the process improvement methodology of choice. In a letter May 3, 2006 memo, Secretary of the Navy Winter said,

> Several elements of the Navy and Marine Corps have engaged in LSS activities to include the training of over 500 Black Belts and 1,500 Green Belts that have facilitated 2,800 events and projects. These activities averaged a 4:1 return on investment. This initiative applies to entities engaged in transactional, service and support missions (Winter, 2006).

G.   THE KNOWLEDGE VALUE-ADDED METHODOLOGY

The Knowledge Value-Added (KVA) methodology provides a framework for determining the value of assets within an organizational process. KVA was developed by Dr. Thomas Housel of the Naval Postgraduate School and Dr.

Valery Kanevsky of Agilent Labs. It is a relatively simple, universal, scalable method for measuring the value of the knowledge within employees and IT.

In KVA, knowledge is defined as "the know-how required to produce process outputs. This kind of knowledge is proportionate to the time it takes to learn it. We have found learning time to be a quick and convenient way to measure the amount of knowledge contained in any given process" (Housel, 2005, p.12). Learning time is measured in terms of common units of time (hours, days, weeks, etc.). A simple KVA analysis example in a military setting may help to improve understanding of this methodology:

> Scenario: A Marine conducts daily site surveys to provide physical security for an installation. He learned to conduct these surveys in a 28-day formal training course. Each survey takes 4 hours to perform. His Return on Knowledge (ROK) is calculated as follows:
>
> ROK = (Output / Input) X Reduction Factor, where:
>
> Output = Learning Time X Times Fired/day X # People
> Input = # People X Times Fired/day X Actual Work Time
> Reduction factor = Proportional adjustment to maintain an intuitive percentage ratio
>
> ROK = ((28 days X 1 survey/day) / (1 Marine X 1 survey/day * 0.5 days)) X 1% = 56%
>
> Furthermore, since the Marine spends 4 of every 8 workday hours conducting surveys, if he earns $40,000 annually, then $20,000 can be attributed to his 250 daily surveys throughout the year, which equates to $80/survey. (This cost per survey metric may be useful for resource allocation and benchmark decisions.)

Reliable estimates of learning time can be made when formal training or education requirements exist to execute a core process. In such a case, the time actively spent learning will provide a sound measure of the knowledge required (in military settings, formal training is traditionally measured in days). However, in many organizations, knowledge is gained by observation and execution of the core processes (typically referred to as OJT, or On-the-Job-Training). To establish reliable OJT estimates, subject matter experts with in-depth familiarity

with the processes being analyzed may be surveyed to determine the relative time that must be dedicated by an average employee to learn all knowledge to execute the core process.

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III. MEASURING THE UTILIZATION OF KNOWLEDGE ASSETS

> One of the most widespread mistakes in performance measurement is to use measures that will inevitably make the organization, its people and especially its managers look good. 'Nobody wants a metric that they don't score a 95 on.' (Hammer, 2007, p.20)

A. KNOWLEDGE DEFINED

The knowledge definition debate is as old as Socrates, Plato, and Aristotle (Kane, 2003). For purposes of this research, knowledge is considered a collection of related information and experiences that can be utilized to produce a desired decision or outcome with respect to situation-specific variables. As a contextual-based element of human cognizance, knowledge is "continually renewing, with the physical systems in an organisation retaining knowledge because they are encouraged by the managerial systems created, to assist learning" (Leonard, 1998). The context in which knowledge is applied is constructed from many pieces of data that form an informational foundation upon which effective decisions can be made and acted accordingly.

Knowledge can be explicit or tacit. Explicit knowledge can be taught, such as how to navigate a website. It can be shared easily because it can be explained or demonstrated. Tacit knowledge must be experienced first-hand because it involves the simultaneous actions of context sensing, memory recollection, and cognitive processing, such as the ability to ride a bicycle or to drive a vehicle with a manual transmission (Skyrme, 1997). Kane differentiates the two simply as "there are aspects of what we know that we cannot clearly enunciate" (2003). KVA considers explicit knowledge to be gained through formal training, and tacit knowledge through on-the-job training (OJT).

B. KNOWLEDGE ASSETS

Knowledge assets are humans and/or computer technology that generate data, collect information and apply experience to make decisions or produce outcomes. "Measuring the knowledge asset, therefore, means putting a value on

people, both as individuals and more importantly on their collective capability, and other factors such as the embedded intelligence in an organisation's computer systems" (Skyrme, 1997). The value of knowledge assets can be gauged by the ratio of the cost to create the knowledge to its frequency of its use. The more often knowledge is applied (i.e. utilization rate) to make a decision or produce a desired outcome, the greater the proportional return on that knowledge.

The value of knowledge assets is affected by (1) the over-utilization point, which is often called "burnout" and (2) how much of a role Information Technology (IT) plays in the acquisition of knowledge. If IT is used to process information in relation to a contextual situation before being acted upon by a human, then IT is said to be used a "knowledge enhancer" in KVA calculations. If used to generate, collect, store, display, or share information, KVA considers IT only a minor additive to knowledge value. In KVA analysis, the calculation of total learning time depends upon the percentage of IT used to gain the knowledge as well as whether the IT was used as a knowledge enhancer or a minor additive.

C. UTILIZATION RATES

Utilization Rate is an important business metric in many industries because it allows decision makers to consider the strength and endurance of an asset and, hence, predict its future performance. Accounting and law firms determine utilization rate by the ratio of hours billed to clients versus hours worked in a given period (Feinberg, 2006). In a 40 hour work-week, if clients are serviced and billed for 10 hours, the utilization rate would be 25% (10 hours / 40 hours). The aviation industry's utilization rate refers to the number of hours per aircraft that a fleet of airplanes are in the air on a given day. These are but two examples. Every industry establishes its own definition and standard of use.

Utilization Rate is used in this research to evaluate the value of knowledge assets. In the KVA model discussed below, Utilization Rate is calculated by multiplying the number of times a Task is completed in a day by the

amount of time the Task takes to complete. The resulting percentage can then be considered in terms of adequate use of knowledge assets. Sustainable Utilization Rates range between 50% and 75% (Feinberg, 2006).

> Example: It takes 0.021 days (10 minutes) to handle a 911/dispatch call. 35 calls are handled daily. Utilization Rate = 35 calls X 0.021 days = 0.735 days, or 73.5%.

D.   KVA MODEL

Table 1 is a snapshot from the KVA model built for this research. The model employs complex formulae and user input to dynamically look up financial and human resource data (ABC Model, 2005). The data is then used to calculate KVA metrics such as Return on Knowledge (ROK) and Utilization Rate.

			251		Work Days/Year				
			8		Work Hours/Day				
			2		OJT Hours/Day				
			MCAS Cherry Point, NC		Installation				
			911 dispatch		Task				
			1%		ROK Reduction				

Task costs:
$1,110.76 /Day
$278,801.72 /Year

Number of Marines	Actual Learning Time	Times Fired per day	With IT as an Additive	With IT as an Enhancer	Total Learning Time	Actual Work Time	Utilization Rate	Total Input per day	Total Output per day	Return on Knowledge
6.110	123.54	34.90	0%	80%	617.68	0.021	72.71%	0.29	3,348.66	11359.92%

Table 1.   KVA Model Snapshot.

The instructions in the light blue box direct the user to update the blue text fields in the upper right corner, including the drop-down lookup selection fields "Installation" and "Task," for which the user desires a KVA analysis. The fields identified with green, numbered boxes are described in greater detail below.

1.   *Military Occupational Specialty (MOS)*. Military Occupational Specialty which requires specific formal training to achieve. A single MOS may complete multiple Tasks.

2.   *Operations MOSs*. Military Police who earn an Operations MOS include Military Police Officers, Basic Military Police, Working Dog Handlers,

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Accident Investigators, Physical Security Specialists, and Special Reaction Team Members. These MPs are the proverbial "cops on the beat," and aim to maintain law and order, prevent crimes through routine patrolling, safety programs and community involvement, and serve as first responders to incidents.

3. *Investigations MOSs.* Not to be confused with accident investigators, MP's who earn Investigations MOS's include Criminal Investigation Officers, Military Police Investigators, Criminal Investigator CID Agents, and Polygraph Examiners. These MP's are responsible for the in-depth analysis of serious allegations of committed acts.

4. *Corrections MOSs.* Military Police serving in the Corrections field include Corrections Officers, Specialists, and Counselors. These MPs are responsible for handling convicted offenders of serious acts.

5. *Work Days/Year.* Number of actual workdays in a fiscal year, which excludes weekends and holidays. In 2005, there were exactly 251.

6. *Work Hours/Day.* Actual productive working hours in a single work day. A typical work day on a Marine Corps installation is from 0730 to 1630 hours, with one hour set aside for lunch, resulting in 8 work hours/day.

7. *OJT Hours/Day.* Number of hours in a workday attributed to learning On-the-Job (not in a formal classroom setting). Any Marine contributing his time towards completing a Task for which he has yet to be formally trained is considered to be on OJT time. Actively learning on the job normally occurs for only a fraction of the work hours/day. In KVA analyses, two hours of OJT in every eight hour work day is a common standard.

8. *Installation.* A garrison activity that serves as a base of operations for tenant commands. May include air, ground, logistics, or training bases. Figure 3 shows the locations of all Marine Corps Installations (MCI). Installation commanders support many diverse tenant commands. Depending upon the primary purpose of the command, garrison organizations have a pre-designator code such as MCB for Marine Corps Base, MCAS for Marine Corps Air Station, MCLB for Marine Corps Logistics Base, MCRD for Marine Corps Recruit Depot or MCAGTFTC for Marine Corps Air Ground Task Force Training Center.
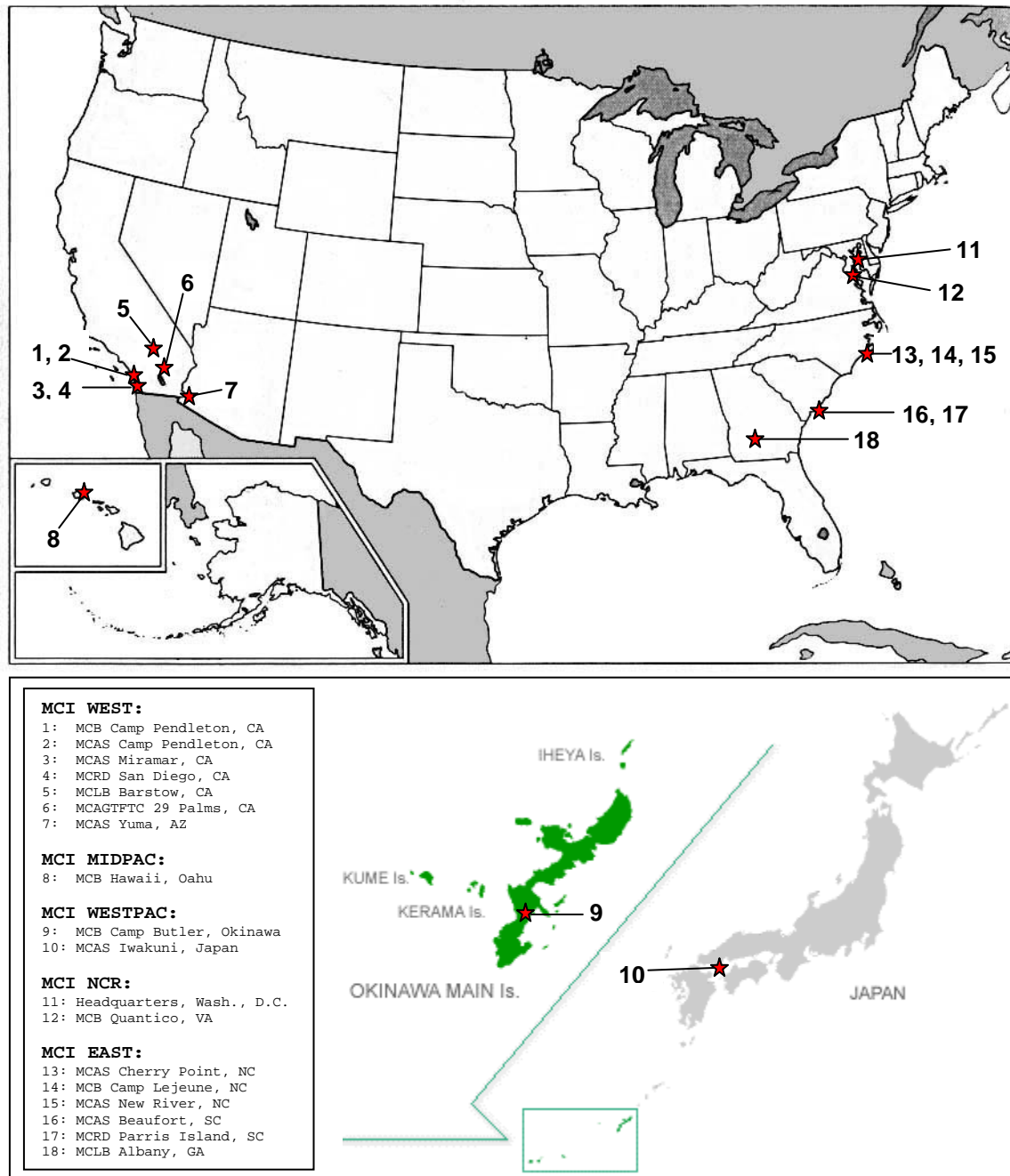
Figure 3. Marine Corps Installations.

MCI WEST:
1: MCB Camp Pendleton, CA
2: MCAS Camp Pendleton, CA
3: MCAS Miramar, CA
4: MCRD San Diego, CA
5: MCLB Barstow, CA
6: MCAGTFTC 29 Palms, CA
7: MCAS Yuma, AZ

MCI MIDPAC:
8: MCB Hawaii, Oahu

MCI WESTPAC:
9: MCB Camp Butler, Okinawa
10: MCAS Iwakuni, Japan

MCI NCR:
11: Headquarters, Wash., D.C.
12: MCB Quantico, VA

MCI EAST:
13: MCAS Cherry Point, NC
14: MCB Camp Lejeune, NC
15: MCAS New River, NC
16: MCAS Beaufort, SC
17: MCRD Parris Island, SC
18: MCLB Albany, GA

In October 2005, Marine Corps leadership reinforced its philosophy of providing direct, customized installation support to area combatant commanders by grouping all installations into regions (HQMC Action Memo, 14 July 2005). MCI NCR (National Capital Region) is a unique organization dedicated to installation support in the immediate area of Washington, D.C. and encompasses

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activities at MCB Quantico, VA. MCI East, headquartered at Camp Lejeune, NC, is responsible for garrison support provided aboard MCAS Cherry Point, NC, MCB Camp Lejeune, NC, MCAS New River, NC, MCAS Beaufort, SC, MCRD Parris Island, SC, and MCLB Albany, GA. MCI West, out of Camp Pendleton, CA, provides installation representation for MCB Camp Pendleton, CA, MCAS Camp Pendleton, CA, MCAS Miramar, CA, MCRD San Diego, CA, MCLB Barstow, CA, MCAGTFTC Twentynine Palms, CA, and MCAS Yuma, AZ. MCI MIDPAC (Mid-Pacific) is based in Hawaii and provides dedicated garrison support to Marine activities aboard Camp Smith and Kaneohe Bay in Hawaii. MCI WESTPAC (West Pacific) is responsible for installation support to MCAS Iwakuni in mainland Japan and MCB Camp Butler on the island prefecture of Okinawa. MCB Camp Butler is the unified reference name for nine camps throughout Okinawa and Camp Fuji in mainland Japan.

9. *Task*. Outcome of applied knowledge. Generally, the end state desired from resources consumed (people, time, and money). A single Task may take multiple MOS's to generate. (See Ch, IV, para. B4 for a list of Tasks used in this KVA model.)

10. *ROK Reduction*. A surrogate variable used to offset the high return values generated when dollar values are not used in ROK calculations. Typically a revenue factor is generated in KVA models using a market comparable dollar value. This KVA model, however, uses a ROK Reduction factor to establish the ratio of knowledge gained to knowledge used without comparing costs to a market comparable. From a mathematical standpoint, a reduction factor adjusts both the numerator and denominator in order to present the final answer in an intuitive percentage range while preserving the original output-input ratio.

11. *Cost/Day*. Total labor dollars expended accomplishing a particular Task and all its iterations for a single day. Using actual labor figures makes it possible to determine an accurate cost estimate of a process at the individual, installation, or Marine Corps level. Table 2 shows the daily cost of enlisted Marines who performed the 911 Dispatch Task at MCAS Cherry Point in 2005

(ABC Model, 2005). Using the KVA model designed for this research, a similar cost table can be constructed for every Task on every installation. (NOTE: a KVA analysis could be expanded to include cost per day for officers and civilians if desired.).

Rank	Number of Marines	Individual Salary per day	Total Cost per day
E-1	0.000	$0.00	$0.00
E-2	1.140	$141.49	$161.29
E-3	2.140	$159.00	$340.26
E-4	1.360	$185.63	$252.46
E-5	1.100	$222.02	$244.23
E-6	0.170	$267.16	$45.42
E-7	0.100	$311.79	$31.18
E-8	0.100	$359.31	$35.93
E-9	0.000	$0.00	$0.00
	6.110	**$1,646.40**	**$1,110.76**

Table 2.   MCAS Cherry Point, NC – Daily 911 Dispatch Cost by Rank.

12.   *Cost/Year*. Annual cost to accomplish the Task on the selected Installation. Calculated by multiplying the Cost/Day by the Work Days/Year.

13.   *Number of Marines*. Number of Marines who contributed to the accomplishment of a Task. The numbers are in decimals because (1) not every Marine works at a base for an entire year, (2) some Marines get promoted throughout the year, (3) Marines have to divide their time completing multiple Tasks, and (4) not all of a Marine's time is spent generating these specific Task – they also spend time doing non-essential or non-standard tasks. In the model, the Number of Marines is looked up on a separate worksheet with static cell data.

14.   *Actual Learning Time*. Actual Learning Time (ALT) in days. Comprised of formal training and OJT. In the model, ALT is based on Task and OJT hrs/day selected. The number of formal training days for each rank is looked up on a separate worksheet. If the rank is too low to be offered formal training in that Task, the Marine's time is considered OJT only.

15.   *Times Fired per Day*.   Knowledge is fired every time a Task is accomplished.   Calculated by dividing the number of tasks completed annually by the number of Work Days/Year.

16.   *With IT as an Additive*.   When Information Technology is used as a minor additive to enable personnel to complete Tasks, Actual Learning Time is increased by a slight productivity percentage (%IT).   Total Learning Time which incorporates IT as a minor additive is measured using the formula, ((Actual Learning Time+(Actual Learning Time*%IT))*(Times Fired per day)*(Number of Marines).

17.   *With IT as an Enhancer*.   When Information Technology is used as a knowledge enhancer to enable personnel to complete Tasks, Actual Learning Time is increased by a significant productivity percentage (%IT). Total Learning Time which incorporates IT as a knowledge enhancer is measured using the formula, ((Actual Learning Time+(Actual Learning Time/(1-%IT)))*(Times Fired per day)*(Number of Marines).

18.   *Total Learning Time*.   Total Learning Time includes all formal training, OJT, and IT support which enables personnel to successfully complete a Task.   When no IT is used, Total Learning Time is calculated using the formula, (Actual Learning Time)*(Times Fired per day)*(Number of Marines).

19.   *Actual Work Time*. Actual Work Time is the number of days it takes to accomplish a task.

20.   *Utilization Rate*. A productivity ratio often used for personnel and IT optimization decisions. Calculated by multiplying the number of Times Fired per day by the Actual Work Time.

21.   *Total Input per Day*. Refers to the amount of Knowledge Asset resources put into a Task.   Calculated by the formula, (Times Fired per day)*(Number of Marines)*(Actual Work Time), and is used to calculate Cost/Day.

22.   *Total Output per Day*. Total output, measured with or without IT. The formulas for each are (#People)*(ALT)*(#Fired) and (#Fired)*(TLT), respectively.

23.   *Return on Knowledge (ROK)*. A universal metric generated in a KVA analysis. Calculated by dividing Total Output by Total Input.

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IV. CASE STUDY: USMC MILITARY POLICE COMMUNITY

Early transformation requires exploiting information technology to reform defense business practices. The Department currently is pursuing transformational business and planning practices such as… output-based management. Senior leadership must take the lead in fostering innovation and adaptation of information age technologies and concepts within their organizations, and they must ensure that processes and practices that are antithetical to these goals are eliminated. (Rumsfeld 2003, April)

A. MILITARY POLICE OVERVIEW

1. Provost Marshal (PM) Responsibilities

According to paragraph 1100 of MCO P5580.2A (1998):

Section D, paragraph 1300 of the Marine Corps Manual (MCMan) tasks commanding officers with the responsibility for the preservation of good order and discipline. In accordance with the provisions of the MCMan, commanding officers exercise this responsibility through the delegation of authority to military police for execution of those missions pertaining to law enforcement and the maintenance of installation security. Accordingly, the Provost Marshal (PM) serves as the installation commander's senior law enforcement representative and as a special staff officer responsible for the operation of the Provost Marshal Office (PMO). The PM is charged with responsibility for, and authority to execute, the following missions:

1. Conduct law enforcement operations
2. Conduct criminal and traffic accident investigations
3. Provide police community services

2. Governing Documents

Many orders and directives have been written at the DoD, DoN, Marine Corps and installation levels which govern the conduct of the MP community. The following are critical governing documents relevant to the performance measurement of the community (ABC Model Standards, 2004, p.63).

MCO P5580.2A Marine Corps Law Enforcement Manual. "This directive establishes general policy pertaining to the missions, organization, authority,

jurisdiction, and operational functions of military police organizations aboard U.S. Marine Corps installations" (MCO P5580.2A, 1998, p.2).

MCO 1510.86B Individual Training Standards System for the Military Police and Corrections Occupational Field (OCCFD) 58. Individual Training Standards

> are used by unit commanders, (Functional Learning Center) directors, and (Distance Learning) developers to design, develop, conduct, and evaluate the individual training of Marines. Unit commanders are responsible for the sustainment of all individual tasks that have been deemed, through analysis, to support the unit's Mission Essential Task List (METL). Unit commanders can, therefore, use the tasks contained in this order as the basis of individual training through Managed On-the-Job Training (MOJT), instruction in unit-level schools, or incorporation in their training plans (MCO 1510.86B, 2000, p.2).

This ITS order pertains to all Marines in the Military Police community, as denoted by the first two numbers of the Military Occupational Specialty (MOS), 58.

MCO 1510.59B Individual Training Standards System for Marine Corps Security Forces. Military Police serving as members of Marine Corps Security Forces are subject to the Individual Training Standards contained in this order.

MCO 5500.6F Arming of Security and Law Enforcement Personnel and the Use of Force. This document provides "uniform procedures and criteria for the arming of security/LE personnel, the carrying of firearms, and training on the use of force" (MCO 5500.6F, 1995, p.1).

MCO 5500.18 Crime Prevention. This purposes of this order are:

- To establish Marine Corps crime prevention policy.
- To promulgate Marine Corps regulations on the storage and security of privately owned weapons aboard bases, stations and posts.
- To provide guidance on planning, organizing, directing, and maintaining installation crime prevention plans.

The Crime Prevention Policy is "to protect military personnel and civilian employees, their families, and Government assets from criminal acts, by minimizing the opportunity and inclination to commit these acts" (MCO 5500.18A, 1993, p.1).

MCO 5530.14 Marine Corps Physical Security Program Manual. "This Manual standardizes requirements for physical security aboard Marine Corps installations and organizations, as well as (MCO 5530.14, 2000, pp. 1-2):

- Provides commanders the authority and responsibility to protect personnel, facilities, property, and material under their command.
- Identifies measures to safeguard personnel, facilities, property and material at all Marine Corps installations and activities.
- Provides guidance for evaluating, planning and implementing Marine Corps command physical security programs.
- Establishes minimum standards.
- Assists those responsible for physical security in their efforts to carry out the assigned mission.

MCO 5510.15A Security of Marine Corps Installations and Resources. The purpose of this order is "to establish policy and procedure for Marine Corps commanders who are authorized to issue regulations for the protection or security of property or places under their command… and to provide guidance relative to the enforcement of the law that prohibits unlawful entry" (MCO 5510.15A, 1993, p.1).

MCO 1630.4A Law Enforcement and Physical Security Activities. The purpose of this order is "to establish policy and procedures for the uniform reporting of law enforcement and physical security activities, in order to submit accurate data to the Department of Defense and the Federal Bureau of Investigation, as required" (MCO 1630.4A, 1991, p.1).

MCO 1640.6 Marine Corps Corrections Program. "This Order establishes policy, procedures, and responsibilities associated with the Marine Corps corrections program" (MCO 1640.6, 2001, p.1).

MCO P1640.4C Marine Corps Correctional Custody Manual (CCM). "Correctional custody is the physical restraint of a person during duty or non-duty

hours, or both, imposed (hence, an awardee) as a punishment under Article 15, and may include extra duties, fatigue duties, or hard labor and an incident of correctional custody" (MCO P1640.4C, 1999, p.1-3). The purpose of this order is "to publish basic policies, standards, and procedures for the operation of Marine Corps Correctional Custody Units" (MCO P1640.4C, 1999, p.1).

MCO 10570.1A DoD Military Working Dog (MWD) Program. A Military Working Dog (MWD) is "any Government owner dog that was procured, acquired or bred to meet working dog requirements of the military departments and DoD agencies. This regulation sets policies and procedures governing the logistics aspects of the DoD (MWD) Program" (MCO 10570.1A, 1990, p.1).

MCO 5500.14A Flight Line Security Program. The FLS program is

> designed to enhance the security of the flight line area through a systematic employment of personnel and equipment. Security priorities are assigned based on the vulnerability assessment/threat and assets being protected. The installation provost marshal serves as the primary staff officer for all FLS matters (MCO 5500.14A, 1996, p.2).

3.   Organizational Structure

According to MCO P5580.2A (1998), "The organizational structure of the Provost Marshal's Office (PMO) may vary (the office may also be called a Military Police Department), but it generally consists of: Police Administration/Services, Operations, and Criminal Investigation Division (CID)." Figure 4 "depicts an ideal PMO organizational structure" (MCO P5580.2A, 1998, Fig. 1-1).
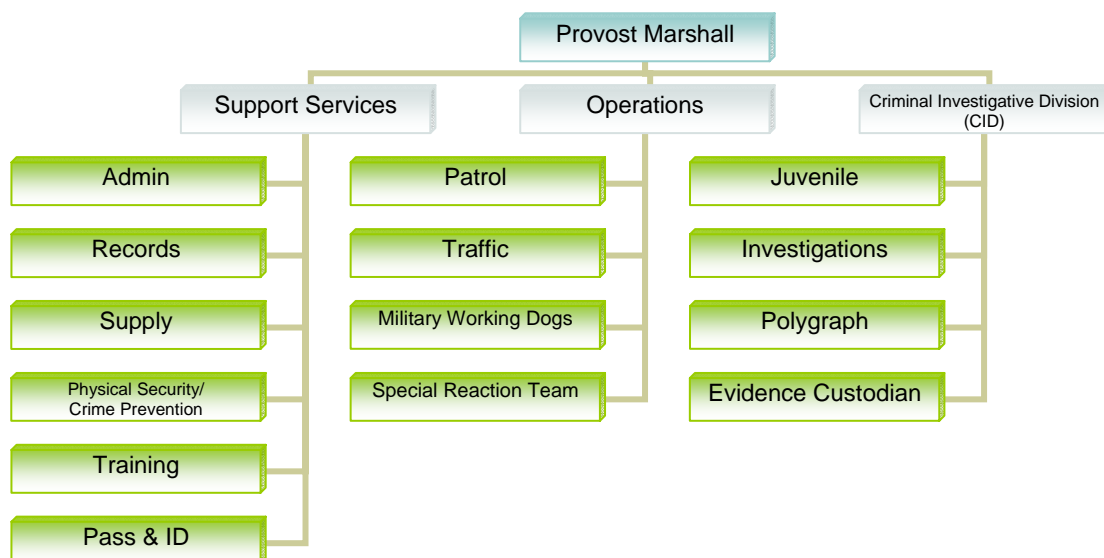
Figure 4.   PMO Organizational Structure.

4.   Primary Functions

Table 3 depicts functional areas of responsibility for a PMO (MCO P5580.2A, 1998, Fig. 1-2):

Function	Services	Operations	Investigations
Patrol		X	
Traffic Enforcement		X	
Military Working Dog (MWD)		X	
Critical Incident Response	X	X	X
Flightline security		X	
Game Warden		X	
Customs		X	
Installation Access control	X	X	
Detention Cells		X	
Protective Services			X
Criminal Investigations			X
Traffic Accident Investigations		X	X
Polygraph			X
Special Events	X	X	X
Registration (Vehicle, Pet, and Weapon)	X	X	
Crime Prevention	X	X	X
Physical Security	X		
Police Records	X	X	X
Lost and Found	X	X	
Vehicle Impound	X	X	
Animal Control	X		
Statistical Reporting	X		
Police/Court Liaison	X		
Special Reaction Team (SRT)		X	
Training	X		

Table 3.   Military Police Primary Functions.

5. Military Occupational Specialty (MOS) skills

The following MOS skills and designators in Table 4 apply to the Military Police Occupational Field 58 (MCO P5580.2A, 1998):

Officer	Enlisted
5803 Military Police Officer	5800 Basic Military Police and Corrections Marine
5804 Corrections Officer	5811 Military Police
5805 Criminal Investigation Officer	5812 Working Dog Handler
	5813 Accident Investigator
	5814 Physical Security Specialist
	5816 Special Reaction Team (SRT) Member
	5819 Military Police Investigator
	5821 Criminal Investigator CID Agent
	5822 Forensic Psycho-physiologist (Polygraph Examiner)
	5831 Correctional Specialist
	5832 Correctional Counselor

Table 4.   Military Police MOS Skills.

B.   PROCESSES, SUB-PROCESSES, ACTIVITIES AND TASKS

1.   Standard Installation Processes

In a KVA analysis, the core processes of an organization are defined and the changes that occur to the process inputs within these processes are identified. Various confirmation sources may be used for verification, including personal interviews of Subject Matter Experts (SME), surveys of organizational leaders and managers, or procedural publications or checklists.

In the Fiscal Year 2004 Activity Based Costing (ABC) Model Standards, the Marine Corps Business Enterprise Office (MCBEO) identified the 37 standard processes conducted aboard all Marine Corps installations (Figure 5). All processes conducted aboard Marine Corps installations are included in this business model, although not all processes are conducted at all installations. One of these processes, "Provide Security," focuses on the Provost Marshall's (PM) responsibilities to the installation commander for the proper execution of the Military Police mission, functions, and skills outlined above.

Installation Process Model
Standard Business Management Categories

Facilities and Land Management	Community Services	Security and Safety	Command and Staff Support	Information Technology	Logistics Support	Training and Operations Support
Provide Real Property and Land Management Services	Develop Family Readiness	Manage Safety Programs	Provide Legal Support	Provide Voice	Provide Transportation	Provide Military Training
Provide Facilities Services	Provide Recreational Opportunities	Provide Security	Provide Command Support	Provide Data Services	Provide Supply Services	Provide Civilian Training
Sustain, Restore, and Modernize Facilities	Develop Physical Wellness	Provide Fire Protection and Emergency Services	Manage Community Relations	Provide Ground Electronic Maintenance	Provide Procurement Services	Provide Aviation Operation Support
Provide Utilities	Provide Personal Support Services		Provide Religious Support		Provide Food Services	Provide Range Management
Provide Environmental Services	Provide Retail/Resale Goods and Services		Manage Financial Resources			Provide Simulation Support
Provide Housing	Provide Lodging Services		Manage Business Practices			Provide Visual Information
	Provide Information and Referral Services		Provide Personnel Support			
	Provide Personal and Professional Development					

May03

Figure 5.   USMC Installation Process Model.

2.   Provide Security Definition

The MCBEO's 2004 ABC Model Standards defines "Provide Security" as "All activities that provide for the security of the installation to include the conduct of criminal investigations, confinement operations, military working dog patrols, traffic court, and other Provost Marshall Office (PMO) activities."

3.   Sub-Processes, Attributes and Activities

Sub-processes, attributes and activities provide additional detail on the high-level "Provide Security" process, enabling a more effective KVA analysis. Table 5 serves as a foundation for a functional crosswalk between the performance measurement and analysis community and the Military Police community's Primary Functions listed above (ABC Model Standards, 2005).

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Sub-Process	Sub-Process Attribute	Activity
Law Enforcement	Crime Prevention	Provide Installation/Physical Security
		Provide Military Working Dog Patrols
		Provide Flight Line Security
		Provide Emergency and Non-Emergency Response
		Support Crime Prevention Activities
	Crime Detection	Conduct Criminal Investigations
		Conduct Off-site Investigations
	Court Proceedings	Provide Court Proceeding support
	Detention Operations	Provide Brig Security
		Provide Prisoner Services
		Manage Prisoner Programs
	Natural Resource Protection	Enforce Conservation Laws
		Conduct Investigations
		Monitor Outlying Land Areas
		Oversee Issuance of Permits
		Oversee Access to Environmental Areas
Community Relations	Traffic Control	Provide Access Control
		Enforce Traffic Regulations
		Investigate Accidents
		Perform Accident Prevention Activities
	Community Well-being	Provide Crime Awareness Briefings/Education Programs
		Provide Non-Law Enforcement Assistance
		Issue passes

Table 5.   Military Police Sub-processes and Activities.

4.   Tasks and Units of Measure

The Tasks listed in Table 6 are the common outputs generated from the Provide Security process. Each Task has a quantitative Unit of Measure that indicates the number of times an acquired knowledge has been used, or "fired" (ABC Model Standards, 2005). The list is not intended to be exhaustive of every PMO. Rather, it signifies the outcomes of the common processes conducted at every installation.

Task	Unit of Measure
911 dispatch	Number of man hours
Accident investigations/reconstruction	Number of man hours
Adjudged Confinement	Number of prisoners and duration
Animal Control	Number of animals processed
Conduct complete investigation on assumable cases	Number of investigations
Conduct preliminary investigation on referable cases	Number of investigations
Correctional Custody Unit	Number of detainees
Crime Prevention/Physical Security	Number of physical security surveys
Customs operations	Number of man hours
Drug Detection	Number of missions
Emergency Response	Number of responses
Explosive Detection	Number of man hours
Flight Line Security	Number of man hours
Game Warden services	Number of man hours
Installation access control	Number of man hours
Intrusion Detection System monitoring	Number of man hours
MP patrols	Number of man hours
MWD law enforcement security patrols	Number of man hours
Non-emergency patrol police services	Number of man hours
Non-law enforcement action	Number of events
Pass Issued	Number of passes issued
Police records/reports	Number of reports distributed
Pretrial Confinement	Number of detainees
Protective Service Operations	Number of man hours
SRT emergency response	Number of man hours
SRT security details	Number of man hours
Traffic Court/Board liaison	Number of hearings attended
Traffic warning/ticket issued	Number of tickets/warnings

Table 6.   Military Police Tasks and Units of Measure.

C.   KNOWLEDGE FLOW

Figure 6 is a graphic depiction of how knowledge is acquired and utilized within a military community at an installation. A description of each numbered entity is provided on the following pages.
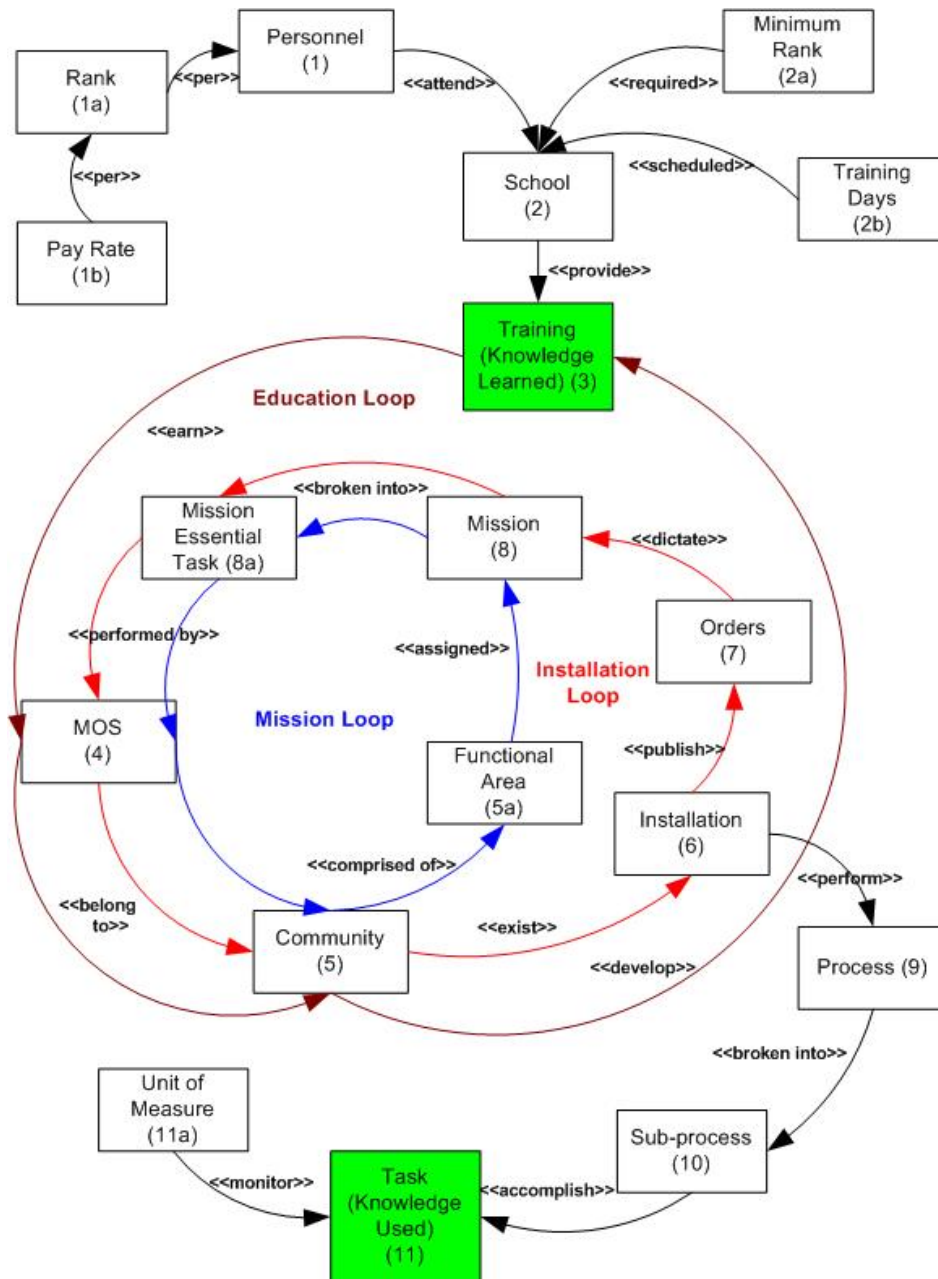
Figure 6.   Knowledge and Performance Measurement Causal Loop Diagram.

1.   Personnel (Input)

Personnel (1) hold a Rank (1a) which has a set Pay Rate (1b). A School (2) requires a Minimum Rank (2a) and is scheduled for a certain number of Training Days (2b). (Ex: A Marine who earns the rank of Lance Corporal (LCpl) earned an annual pay of $39,909 in 2005. As a LCpl, he was allowed to attend the Military Working Dog Supervisor course, which was 20 days in duration.)

2.   Education Loop

Personnel (1) attend a School (2) that provides Training (3), earn an MOS (4), and become part of a specific Community (5). (Ex: A LCpl who attends the MWD Supervisor course earns the 5812 MOS, and is part of the Military Police Community.)

3.   Mission Loop

A Community (5) is comprised of Functional Areas (5a) which have assigned Missions (8) that are broken into measureable Mission Essential Tasks (8a). (Ex: The Military Police Community is comprised of 26 Functional Areas, each of which is assigned a Mission – The Military Working Dog FA is assigned the mission of training and employing dogs in support of garrison law enforcement or combat operations.)

4.   Installation Loop

A Community (5) also exists aboard Installations (6) which follow or publish Orders (7) that dictate Missions (8). (Ex: The Military Police Community aboard Marine Corps Base Camp Pendleton publishes Base Orders or follows Marine Corps Orders such as NAVMC 3500.10, MILITARY POLICE AND CORRECTIONS TRAINING AND READINESS MANUAL, in order to remain proficient in their duties.)   Missions (8) are performed by those with the appropriate MOS(4).   (Ex: The mission to perform first aid on a MWD is performed only by Marines with the 5812 MOS.)

5.   Performance (Output)

Installations (6) perform standard Processes (9) that are broken into Sub-processes (10) which complete Tasks (11) whose performance can be monitored with Units of Measure (11a).   (Ex: Camp Pendleton performs the Standard Marine Corps Installation Process of "Providing Security" which generates products and services such as MWD Security Patrols. Units of Measure (such as Return on Knowledge (ROK)) are used to monitor how well these Tasks are provided. (Ex: The ROK of a MWD Security Patrol can be calculated by dividing the number of times knowledge of conducting a MWD Security Patrol is fired by the amount of hours it takes to learn how to conduct such a patrol.)

D. DATA COLLECTION METHODOLOGY

1. Assumptions

MOS involvement. In order to determine which MOS skills directly relate to a specific task, the NAVMC 3500.10, Military Police Corrections and Training Manual, was consulted. Table 7 is a logical crosswalk between the MOS descriptions in this manual and the Tasks listed in Table 6.

	911 dispatch	Accident investigations/reconstruction	Adjudged Confinement	Animal Control	Conduct complete investigation on assumable cases	Conduct preliminary investigation on referable cases	Correctional Custody Unit	Crime Prevention/Physical Security	Customs operations	Drug Detection	Emergency Response	Explosive Detection	Flight Line Security	Game Warden services	Installation access control	Intrusion Detection System monitoring	MP patrols	MWD law enforcement security patrols	Non-emergency patrol police services	Non-law enforcement action	Pass Issued	Police records/reports	Pretrial Confinement	Protective Service Operations	SRT emergency response	SRT security details	Traffic Court/Board liaison	Traffic warning/ticket issued
5811 Basic Military Police	X			X	X	X		X	X	X	X	X	X	X	X		X	X	X	X	X	X		X		X		
5812 Working Dog Handler																		X										
5813 Accident Investigator		X																										X
5814 Physical Security Specialist								X								X												
5816 Special Reaction Team Member											X							X							X			
5819 Military Police Investigator	X				X	X																						
5821 Criminal Investigator CID Agent	X				X	X		X			X								X	X		X		X				
5822 Polygraph Examiner					X	X																X					X	
5831 Correctional Specialist			X																				X					
5832 Correctional Counselor							X																					

Table 7. MOS-to-Task Crosswalk.

Work Days per Year. Although there are a specific number of work days in a given fiscal year, not every Marine works every day due to illness, vacation, travel, etc. It was assumed that all installation experience a proportional amount of personnel time lost, therefore it was not necessary to factor in that level of detail.

Work Hours per Day. Using the same logic as Work Days per Year, it was assumed that all installations experienced the same amount of fluctuations in work schedule, therefore eight hours was chosen as the average for each installation.

Installations. In the Marine Corps, installations are run by independent chains of command from the tenant commands which may use the installation as an operating base for training or deployment preparation. This KVA model only considers the knowledge assets used to maintain the installation infrastructure, not the deployable commands which reside upon it.

Learning time. It was assumed that every Marine who contributed to the accomplishment of a Task had received the appropriate formal training for his rank. Likewise, those who did not have sufficient rank to attend formal training for a particular Task were assumed to be conducting On-the-Job Training (OJT) for calculation purposes. (For a list of formal training days for each MOS and Task, refer to Appendix C.)

Percent IT Support. No conclusive data exists to attribute a specific amount of IT support to the learning time of the Tasks. Therefore, the following reasonable estimations were made for demonstration purposes. Depending upon local conditions, definitions, and leadership experience, percentages may change from installation to installation. The Tasks that use IT as a Knowledge Enhancer (%IT-KE) or as a Minor Additive (%IT-MA) are listed in Table 8:

Task	%IT-KE	%IT-MA
911 dispatch	0%	50%
Accident investigations/reconstruction	15%	0%
Conduct complete investigation on assumable cases	0%	10%
Conduct preliminary investigation on referable cases	0%	5%
Customs operations	0%	15%
Drug Detection	5%	0%
Explosive Detection	5%	0%
Flight Line Security	10%	0%
Game Warden services	0%	5%
Intrusion Detection System monitoring	60%	0%
Non-emergency patrol police services	0%	5%
Pass Issued	10%	0%
Police records/reports	35%	0%
Pretrial Confinement	0%	5%
SRT emergency response	5%	0%
Traffic warning/ticket issued	0%	5%

Table 8.   Percent of IT Support per Task.

Actual Work Time. Estimations of Task duration were used to calculate AWT, as there is no standard used within the MP community, and experiences vary widely. These estimations do not detract from the intent to demonstrate the effectiveness of the KVA methodology, as they can be adjusted to fit the user's situational knowledge. Table 9 lists the estimated Actual Work Time used for each Task in this model:

Task	AWT
911 dispatch	10 min
Accident investigations/reconstruction	30 min
Adjudged Confinement	6 hrs
Animal Control	1 hr
Conduct complete investigation on assumable cases	3 days
Conduct preliminary investigation on referable cases	2 days
Correctional Custody Unit	12 hrs
Crime Prevention/Physical Security	4 hrs
Customs operations	4 hrs
Drug Detection	4 hrs
Emergency Response	15 min
Explosive Detection	6 hrs
Flight Line Security	5 min
Game Warden services	1 hr
Installation access control	1 min
Intrusion Detection System monitoring	10 min
MP patrols	2 min
MWD law enforcement security patrols	10 min
Non-emergency patrol police services	1.5 min
Non-law enforcement action	8 hrs
Pass Issued	1 min
Police records/reports	30 min
Pretrial Confinement	1 hr
Protective Service Operations	3 hrs
SRT emergency response	2 hrs
SRT security details	2 hrs
Traffic Court/Board liaison	3 hrs
Traffic warning/ticket issued	15 min

Table 9.   Estimated Actual Work Time per Task.

Cost/Year. Pay and allowances depend upon rank, years of service, operational assignments, bonuses, deductions, tax status, and other factors. In this model, average salaries for each rank were established using the data collected at each installation (ABC Model, 2005).

2.   Labor and Knowledge Usage

There is no direct relationship between labor and knowledge usage. Annual labor usage is calculated by multiplying the number of actual hours worked per day times the number of actual work days per year. However, not all labor hours are driven towards standard Tasks. It is not uncommon for personnel to perform locally specific Tasks mandated by the installation commander, supervisors, leaders, and managers. Likewise, not all labor hours are spent using acquired knowledge. For example, a Marine works eight hours per day for 250 days in a year (2000 man-hours). He may spend an average of seven hours per day using knowledge gained from formal and informal training and one hour per day traveling, taking periodic breaks, or assisting another Marine in a Task for which he was not trained. In this case, only 1,750 man-hours would be measured (7/8 of each day) towards standard Tasks.

3.   Length of Sample Period.

As discussed in Chapter II, the data used in this model was collected over the entire Fiscal Year 2005 (October 2004 – September 2005) by the Marine Corps installation Business Performance Offices (BPO). This sample period lends itself well to analysis since budget and expense decisions are typically made in increments of one fiscal year. Formal school quotas are also structured on a fiscal year basis. Finally, the period is long enough to establish reliable trend data, but short enough to observe and analyze for near-term resource allocation decisions and manpower adjustments.

4.   Learning Time

Learning Time is comprised of two distinct sources: formal classroom training and informal, on-the-job training. In order to collect this data, the MOS Roadmap handbooks were consulted. These handbooks contain all of the relevant formal training schools and courses for each rank and MOS. The number of formal classroom days for each school and course (Appendix C) were loaded into the KVA model along with the minimum rank required to attend. This method allowed the dividing line between formal and informal training to become visible for calculation purposes.

E.   INSTALLATION KVA ANALYSIS

Table 10 is an analysis of all MP Tasks performed in 2005 at MCAS Cherry Point, NC. This installation was randomly chosen from among the 16 Marine Corps installations from which cost and performance data was collected. A similar analysis could be accomplished for any Marine Corps installation.

Task	Number of Marines	Actual Learning Time	Times Fired	With IT as a Minor Additive	With IT as a Knowledge Enhancer	Total Learning Time	Actual Work Time	Average Utilization Rate	Total Input	Total Output	Return on Knowledge	Total Cost per day
Emergency Response	0.150	150.00	6.41	0%	0%	150.00	0.031	133.55%	0.01	224.36	28474.58%	$35.89
Animal Control	0.130	385.00	0.74	0%	0%	385.00	0.125	71.25%	0.00	40.76	15459.46%	$35.58
Non-emergency patrol police services	1.060	60.00	256.65	5%	0%	63.00	0.003	75.66%	0.23	2,313.44	10097.75%	$275.30
Pass Issued	3.800	49.00	321.80	0%	10%	54.44	0.002	17.64%	0.50	2,502.86	4992.49%	$1,082.52
Flight Line Security	3.070	56.00	104.99	0%	10%	62.22	0.010	35.62%	0.81	933.23	1158.71%	$559.02
MWD law enforcement security patrols	4.960	196.00	29.07	0%	0%	196.00	0.021	12.21%	1.31	1,424.32	1084.94%	$956.96
Intrusion Detection System monitoring	6.110	70.00	34.90	0%	60%	175.00	0.021	11.90%	1.07	872.51	815.78%	$1,110.76
MP patrols	13.680	64.00	127.03	0%	0%	64.00	0.004	3.87%	1.68	1,016.22	606.19%	$2,545.38
Installation access control	30.770	64.00	385.03	0%	0%	64.00	0.002	2.61%	5.89	3,080.22	522.55%	$5,617.13
Protective Service Operations	0.270	45.00	0.98	0%	0%	45.00	0.250	90.75%	0.03	15.44	498.83%	$52.86
Police records/reports	1.390	50.00	13.83	0%	35%	76.92	0.063	62.18%	0.36	150.00	419.75%	$336.13
911 dispatch	6.110	82.00	34.90	50%	0%	123.00	0.021	11.90%	1.07	440.05	411.44%	$1,110.76
Crime Prevention/Physical Security	1.020	196.00	1.05	0%	0%	196.00	0.500	51.36%	0.17	29.34	172.99%	$272.48
Accident investigations/reconstruction	2.580	30.00	36.59	0%	15%	35.29	0.063	88.64%	3.15	430.47	136.75%	$493.85
Customs operations	0.620	56.00	1.47	15%	0%	64.40	0.500	118.24%	0.10	13.49	128.47%	$114.54
Conduct complete investigation on assumable cases	2.410	1062.00	0.32	10%	0%	1168.20	3.000	40.17%	0.73	82.78	113.74%	$657.61
Explosive Detection	0.370	32.00	0.20	0%	5%	33.68	0.750	41.19%	0.02	1.71	73.53%	$71.71
Traffic Court/Board liaison	0.610	20.00	2.09	0%	0%	20.00	0.375	128.58%	0.12	7.37	60.93%	$166.99
Drug Detection	0.710	32.00	0.18	0%	5%	33.68	0.500	12.91%	0.03	1.54	54.53%	$137.40
Conduct preliminary investigation on referable cases	5.380	254.00	0.16	5%	0%	266.70	2.000	5.78%	0.52	8.65	16.64%	$1,468.49
SRT security details	6.930	35.00	1.53	0%	0%	35.00	0.250	5.52%	0.88	7.65	8.73%	$1,320.34
Non-law enforcement action	2.240	25.00	0.23	0%	0%	25.00	1.000	10.32%	0.19	0.44	2.37%	$508.67
	94.370		1360.14				9.491	65.85%	18.86	13,596.85	720.88%	$18,930.37

Table 10.   Installation KVA Analysis.

1.   Average Utilization Rate

Average Utilization Rate is the ratio of the amount of time it takes to complete a Task to the number of times the Task is performed daily, adjusted for the number of Marines who perform it. For example, Table 10 shows 321.8 passes per day being issued at a rate of 0.002 days (1 minute) each by 3.8 Marines, resulting in an Average Utilization Rate of 17.64% (321.8 passes * 0.002 days / 3.8 Marines). At such a low rate, it is likely these Marines perform additional Tasks each day. In fact, a high utilization rate does not necessarily indicate that the Task was performed by the same Marine. It is simply an indicator that the Task was performed for an extended amount of time. Marines can and often do share the burden of accomplishing extended Tasks.

Of the 22 standard installation tasks conducted at MCAS Cherry Point, five are over 80% Average Utilization Rate (red cells), four are between 50% and 80% (light green cells), and 13 are below 50% (pale yellow cells). This macro

snapshot allows the installation Provost Marshal (PM) to visualize his Military Police department's overall productivity, which he can calculate by using the same formula for all his Tasks (1360.14 Times Fired * 9.49 man-days / 94.37 Marines), resulting in an organizational Average Utilization Rate of 65.85% which, by all accounts, is an indefinitely maintainable rate. Likewise, he can see which Tasks are taking exceptionally little or significant amount of time (yellow or red cells, respectively).

2.   Return on Knowledge

An alternate performance metric from Average Utilization Rate, Return on Knowledge (ROK) provides a measure of the value of a process with respect the time it takes to learn it. The bubble chart in Figure 7 graphically illustrates the mutually exclusive relationships between Average Utilization Rate, Return on Knowledge, and Daily Cost. Each bubble represents a single Task. The higher up on the chart a Task appears, the higher its Average Utilization Rate. The further right it appears, the higher its Daily Cost. The larger it is, the larger its ROK. Ideally, a leader would want a Task to appear in the fourth bar of the graph (60-80% Average Utilization Rate), all the way to the left, which would indicate a low-cost, indefinitely sustainable Task. (Also, the leader would want the bubble to be as large as possible, although he may have relatively little control over (1) how long it takes to learn a Task and (2) how often that Task is performed.)

There is no direct relationship between Tasks with a high ROK and Tasks with a high Average Utilization Rate. For example, "Flight Line Security" (dark purple) and "MWD law enforcement security patrols" (coral) both generate an ROK of approximately 1100% (notice their bubbles are almost identical in size). However, Flight Line Security has nearly three times the Average Utilization Rate (~36% versus ~12%) and costs roughly half as much to perform ($559 versus $957).

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Legend:
- Emergency Response
- Animal Control
- Non-emergency patrol police services
- Pass Issued
- Flight Line Security
- MWD law enforcement security patrols
- Intrusion Detection System monitoring
- MP patrols
- Installation access control
- Protective Service Operations
- Police records/reports
- 911 dispatch
- Crime Prevention/Physical Security
- Accident investigations/reconstruction
- Customs operations
- Conduct complete investigation on assumable cases
- Explosive Detection
- Traffic Court/Board liaison
- Drug Detection
- Conduct preliminary investigation on referable cases
- SRT security details
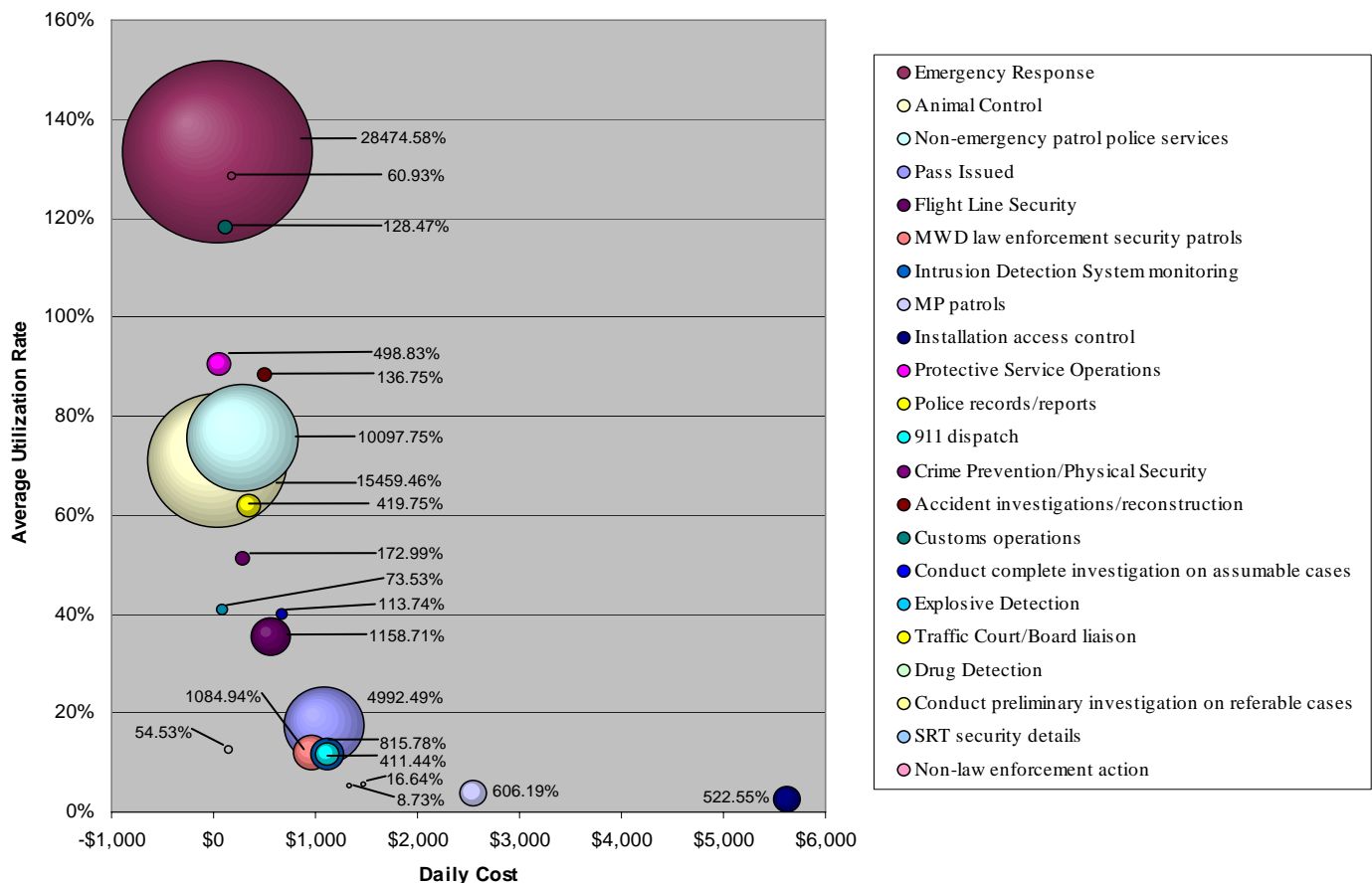- Non-law enforcement action

Figure 7.   ROK, Average Utilization Rate, and Daily Cost.

3.   Cost as a Decision Factor

KVA is designed to support leadership decisions regarding any type of resource usage and allocation in support of a process. As the literary review in Chapter II suggests, the most important resource tends to be financial. However, this research paper focuses on knowledge assets, i.e. human and IT resources, as the decision-maker's primary resource, with cost being considered a dependent variable of labor.

To put a dollar value on the processes in the KVA model above, an average salary is calculated for each Marine. The Average Actual Total Income rates shown in Table 11 are for Marine Corps enlisted personnel, and were used in the KVA model designed for this research (ABC Model, 2005).

Rank	Average Actual Total Income	Basic Pay Chart Averages
E-1	$31,537	$14,822
E-2	$35,513	$16,614
E-3	$39,909	$19,470
E-4	$46,593	$22,807
E-5	$55,728	$27,382
E-6	$67,058	$31,429
E-7	$78,259	$37,036
E-8	$90,186	$45,273
E-9	$108,956	$53,460

Table 11.   Average Actual Total Income vs. Basic Pay Chart Averages.

It is important to note that the costs used in the KVA model built for this research were based on the Average Actual Total Income (average payday earnings), not the Basic Pay Chart Averages. The Average Actual Total Income amounts present a more accurate picture of true knowledge cost because they take into consideration the number of years a Marine has served as well as all his actual income, which could include one or more of nearly 70 different special pay and allowances received for a current assignment. Examples include taxable pay for hazardous duty incentive, imminent danger, reenlistment bonus, sea, aviation, parachutist, diving, and foreign language proficiency, as well as tax-exempt allowances for housing, subsistence, family separation and cost of living, just to name a few.

Stepping back to the "30,000 foot view," Table 12 below shows the macro-perspective of all processes across the entire MP community at all Marine Corps installations. This useful analytical report generated by the KVA model shows community leaders, particularly at Headquarters, Marine Corps and at the formal schools, exactly how many MP's are being employed for each Task at each installation (ABC Model, 2005).

	MCAGTFTC 29 Palms, CA	MCAS Beaufort, SC	MCAS Camp Pendleton, CA	MCAS Cherry Point, NC	MCAS Iwakuni, Japan	MCAS Miramar, CA	MCAS New River, NC	MCAS Yuma, AZ	MCLB Albany, GA	MCLB Barstow, CA	MCB Camp Butler, Okinawa	MCB Camp Lejeune, NC	MCB Camp Pendleton, CA	MCB Camp Smith, HI	MCB Quantico, VA	MCRD San Diego, CA	PROCESS TOTALS
911 dispatch	$0	$853	$238	$1,111	$958	$718	$0	$0	$0	$446	$1,345	$0	$779	$676	$3,183	$0	$10,306
Accident investigations/ reconstruction	$409	$401	$0	$494	$25	$919	$72	$417	$0	$333	$4,352	$0	$779	$2,065	$6,135	$462	$16,863
Adjudged Confinement	$0	$0	$0	$0	$1,015	$638	$0	$0	$0	$0	$4,817	$3,168	$779	$671	$6,687	$0	$17,775
Animal Control	$235	$1,479	$0	$36	$43	$238	$8	$0	$55	$0	$1,049	$3,451	$779	$671	$3,183	$0	$11,227
Conduct complete investigation on assumable cases	$462	$559	$0	$658	$30	$744	$48	$836	$1,019	$553	$941	$0	$779	$671	$1,624	$1,445	$10,371
Conduct preliminary investigation on referable cases	$0	$422	$0	$1,468	$1,032	$744	$48	$417	$0	$397	$495	$444	$779	$671	$1,624	$926	$9,468
Correctional Custody Unit	$0	$0	$0	$0	$6	$638	$0	$0	$0	$0	$652	$6,223	$779	$671	$0	$0	$8,968
Crime Prevention/ Physical Security	$389	$1,821	$111	$272	$910	$238	$34	$0	$0	$520	$750	$3,451	$779	$671	$3,183	$1,308	$14,436
Customs operations	$0	$261	$0	$115	$376	$238	$0	$0	$0	$0	$756	$3,451	$779	$671	$3,183	$0	$9,830
Drug Detection	$0	$261	$0	$137	$47	$799	$28	$0	$0	$493	$888	$344	$779	$671	$3,183	$0	$7,630
Emergency Response	$0	$1,485	$0	$36	$358	$209	$28	$0	$0	$372	$2,540	$0	$779	$671	$3,183	$0	$9,660
Explosive Detection	$0	$261	$0	$72	$47	$774	$14	$0	$0	$413	$1,753	$344	$779	$671	$1,624	$0	$6,753
Flight Line Security	$412	$2,781	$0	$559	$602	$209	$318	$0	$0	$0	$675	$0	$779	$671	$0	$0	$7,006
Game Warden services	$0	$239	$0	$0	$36	$66	$8	$0	$0	$0	$652	$3,451	$779	$671	$1,624	$0	$7,526
Installation access control	$1,487	$3,660	$0	$5,617	$750	$209	$281	$0	$137	$361	$2,074	$420	$779	$671	$1,624	$0	$18,070
Intrusion Detection System monitoring	$583	$321	$0	$1,111	$535	$209	$34	$0	$0	$302	$652	$0	$779	$671	$1,624	$0	$6,820
MP patrols	$3,565	$2,346	$741	$2,545	$2,283	$945	$661	$0	$1,247	$1,039	$14,090	$0	$779	$671	$3,183	$3,927	$38,020
MWD law enforcement security patrols	$493	$2,266	$0	$957	$555	$209	$28	$0	$0	$587	$3,470	$344	$779	$671	$3,183	$730	$14,270
Non-emergency patrol police services	$143	$2,267	$0	$275	$15	$718	$151	$0	$0	$772	$652	$0	$779	$671	$0	$0	$6,444
Non-law enforcement action	$2,490	$470	$143	$509	$1,389	$567	$67	$0	$0	$595	$296	$49	$779	$963	$0	$0	$8,317
Pass Issued	$970	$266	$670	$1,083	$337	$567	$0	$0	$0	$766	$331	$149	$779	$963	$22	$501	$7,404
Police records/ reports	$0	$1,479	$0	$336	$800	$919	$186	$0	$0	$0	$2,395	$95	$779	$671	$3,183	$313	$11,155
Pretrial Confinement	$0	$239	$0	$0	$425	$638	$0	$64	$379	$0	$4,963	$3,144	$779	$671	$6,687	$0	$17,989
Protective Service Operations	$0	$239	$0	$53	$551	$209	$0	$13,459	$0	$0	$652	$0	$779	$671	$3,183	$0	$19,795
SRT emergency response	$0	$281	$0	$0	$26	$1,058	$91	$0	$0	$0	$1,735	$118	$779	$671	$3,183	$0	$7,941
SRT security details	$0	$33	$0	$1,320	$77	$1,058	$104	$0	$0	$0	$652	$281	$779	$671	$3,183	$0	$8,157
Traffic Court/Board liaison	$699	$10	$0	$167	$168	$282	$9	$0	$0	$835	$451	$95	$779	$671	$1,624	$396	$6,188
Traffic warning/ ticket issued	$0	$484	$1,164	$0	$14	$614	$165	$0	$0	$0	$490	$340	$779	$963	$22	$72	$5,106
Total Cost/Day	$12,338	$25,186	$3,067	$18,930	$13,412	$15,374	$2,382	$15,192	$2,837	$8,784	$54,567	$29,361	$21,806	$21,064	$69,113	$10,079	$323,492
Number of Marines	64.73	129.95	16.92	94.37	71.46	76.98	13.24	78.81	13.30	44.50	303.80	153.46	116.20	97.27	351.93	47.42	1,674.34
Daily Cost per Marine	$191	$194	$181	$201	$188	$200	$180	$193	$213	$197	$180	$191	$188	$217	$196	$213	$3,121

Table 12.   Daily Cost of all MP Processes.

V.   CONCLUSIONS AND RECOMMENDATIONS

> The war on terrorism does not supplant the need to transform DoD; instead, we must accelerate our organizational, operational, business, and process reforms.
>
> — Donald H. Rumsfeld, Former Secretary of Defense (MCBE Strategic Plan 2004, Preface)

> Efficiency equals effectiveness. We all need to be cognizant of the fact that when we spend a dollar, if we're not spending it well, then we are taking it out of our combat capability.
>
> — Gordon R. England, Secretary of Defense (MCBE Strategic Plan, 2004, Preface)

A.   CONCLUSIONS

In this thesis, the goals of the Federal Government, DoD, USMC, and the American taxpayer were considered to be in concert with the definition of "strategy," according to Marine Corps Doctrinal Publication 1-1:

> At its most basic, strategy is a matter of figuring out what we need to achieve, determining the best way to use the resources at our disposal to achieve it, and then executing the plan. (MCBE Strategic Plan, 2004, Introduction)

A common adage is that "time equals money." The Secretary of the Navy has said that people are the Department's most precious resource. To implement a strategy as defined above, time, money, and people must be used optimally. If leaders focus too heavily on optimizing time and money, and not enough on personnel productivity, true optimization will not be possible. Personnel productivity must be quantitatively measured with respect to organizational goals. Techniques for performance measurement, benchmarking, and process improvement must be flexible enough to ensure long-term stability.

Where no quantitative measurement technique appears possible, the KVA methodology can still be utilized simply because it measures the value produced by the people, not the process itself.

A baseline process value estimation system can serve as the proper foundation for Continuous Process Improvement efforts. Value Stream Mapping and Analysis encompasses all the planning, execution, products, and services that go into a process to create value for a customer. KVA supports this intent by establishing a common metric to measure the productivity of personnel as they generate products and services for any process.

The KVA model presented in this research serves two purposes: (1) to explain the construction and operation of the KVA methodology using a standard spreadsheet program as a medium and (2) to demonstrate the scalability and flexibility of KVA as a useful decision support tool at multiple levels of command. The analysis in Chapter IV explained how KVA increases the Provost Marshal's (PM) situational awareness of how resources are being used in support of assigned responsibilities and functions, enabling policies and procedures to be adjusted or personnel and IT to be reallocated to the Tasks which require more knowledge assets. Periodically, the PM may elect to validate the collected data, the Actual Work Time, or the percent of IT used to support a Task. He may also consider any anomalies during the year, which may have skewed the annual figures.

1. Measuring Return Value

The primary intent of this research was to answer the question, "How can the Marine Corps measure the return value of its critical processes?" As evidenced by the detailed KVA model analysis in Chapters III and IV, return value can be measured using a universal cost/benefit ratio of knowledge used to knowledge learned. The MP community was used as an example to demonstrate that Return on Knowledge (ROK) and Utilization Rate are two metrics that should be used to optimize knowledge assets for all processes, and that KVA is a simple, universal, flexible, scalable calculation methodology. ROK

can be used in conjunction with other metrics such as Utilization Rate and Daily Cost to optimize processes with the most efficient mix of personnel and IT support.

Utilization rate of knowledge assets is a metric worthy of particular attention because it can be used to analyze saturation points in personnel productivity. Ideally, a utilization rate of 60-80% can be maintained indefinitely, and leaders should seek to increase ROK as much as possible without over utilizing their resources.

In order to lower Utilization Rate, a decision maker's first reaction may be to commit more personnel from an under utilized to an over utilized Task. However, more people means more input, which may lower the ROK. To maintain a high ROK without increasing Utilization Rate, leaders may opt to invest in IT which improves Total Learning Time (TLT) and reduces Actual Work Time (AWT), which will subsequently improve Total Output and allow output to keep pace with the increased input of adding more personnel to a Task.

With respect to cost as a decision factor, a macro-perspective analysis of the entire MP community was conducted in Chapter IV, which allows decision makers to ask resource allocation questions such as:

1.   What are the causes of the apparent anomalies at certain installations, such as the high costs of Protective Service Operations at MCAS Miramar, of Correctional Custody Unit (CCU) at MCB Camp Lejeune, and of MP Patrols at MCB Camp Butler?

The answers may be as simple as:

- MCAS Miramar attributed nearly all its MP costs to the Protective Service Operations process, which gave that installation an unusually high result.
- Camp Lejeune's CCU costs may be justifiably high because it operates the largest non-joint CCU in the Marine Corps.
- Camp Butler's voluminous MP Patrols may be a factor of not only being located in a foreign nation, but of being a conglomerate of 10 individual camps throughout Okinawa and mainland Japan. Hence, the extensive patrols may be justifiable.

2. **The average daily cost per Marine is approximately $195 regardless of the number of Marines or processes performed. What causes some installations' manpower to cost only $180-$185 per Marine, while others are over $210?**

This question raises an excellent point, which is typical of a macro perspective: cost per person. If all PM's have similar responsibilities and are proportionally and adequately staffed, it is reasonable to expect per capita labor costs to be similar from installation to installation, not fluctuate 10% from the mean. Such a fluctuation may identify the need for a detailed review of the Table of Organization for each installation, and adjusting the manpower assignments to spreadload the effort more evenly across the Marine Corps.

3. **When comparing the Average Utilization Rates for the Tasks at MCAS Cherry Point in Table 10 their respective costs in Table 12, it is interesting that the high Utilization Rates are not necessarily in expensive Tasks. What causes a Task process to become bottlenecked and how can installation PM's use this data to better allocate personnel to streamline those processes?**

This question focuses more on a micro-perspective that would interest an installation PM vice Headquarters, Marine Corps. High Average Utilization Rates which suggest insufficient staffing for a Task may be easily corrected by implementing a policy change to accommodate surges in a particular process. Another solution to over utilization is a Business Process Reengineering (BPR) study on that process in order to improve the efficiency of a Task. The infusion of Information Technology (IT) into a process is often considered in BPR studies because it may improve ROK and reduce Utilization Rates.

All these questions and answers depend upon unique factors for each location, such as high operational tempo, cost of living, or deployment support. Regardless of unique variables that can make benchmarking difficult, a report like this aids in the improvement of performance measurement from year to year,

and can support or defend funding and staffing adjustments simply by providing a focal point for decision makers to plan strategies for process improvement.

2. Benchmarking Installations and Processes

If KVA is the best option for benchmarking, the follow-on question comes naturally: "How can the Marine Corps make fair benchmark analyses in support of effective budgetary decisions?" The answer, however, may not come as naturally. As the Marine Corps learned through its intense, five-year ABC program, data collection can quickly reach a point of diminishing returns. KVA solves two show-stopping problems typically associated with ABC:

(1) KVA does not attempt to attribute *all* organizational costs to a measurable activity. Instead, it allows leaders and managers at all levels to maintain awareness of critical processes and the resources used to accomplish important tasks. When the processes and tasks are standardized across multiple organizations, effective benchmarking becomes possible and can be used to justify additional resources or defend against funding cuts and force reduction.

(2) KVA does not require personnel to be manually associated with disparate tasks, a time-consuming effort. By virtue of a person's skill set and qualifications, analysis can be done automatically, based on input and output. Multiple linkages between resources, activities, and costs need to be done.

Cost data is helpful in benchmarking both the personnel and cost to perform a specific process at a specific location. Commanders, leaders, and managers can use these benchmarks to compare how other installations accomplish the same Tasks with different ranks and numbers of personnel. By monitoring costs of tasks and skill sets across multiple organizations (see Table 12), formal training can be tailored to locations that need it most and staffing efficiencies can be made at installations on a more consistent basis.

KVA naturally supports Continuous Process Improvement (CPI) initiatives. The CPI philosophy advocates an environment of constant awareness of process efficiency and resource utilization, as does KVA. Lean Six Sigma, a results-based process improvement technique for minimizing waste, has been adopted

as the method of choice across DoD, DoN, and the Marine Corps for implementing CPI initiatives. KVA supports Lean Six Sigma as a low-cost performance measurement technique to aid in the implementation of, and maintain the successes from, Lean Six Sigma projects. KVA is also ideally suited to aid in Value Stream Analyses by virtue of the fact that it can provide a defendable performance measurement metric where none may exist by simply placing a value on the knowledge used in a process.

The analysis contained in this document represented a solution to establish quantifiable performance metrics for all processes, including those which may be qualitative in nature, by using knowledge value as a measuring stick. By filling the gap in resource management, value analysis and process improvement, KVA presents itself as a valuable methodology for improving efficiency. This capability provides LSS project managers with a defensible metric of measuring value, and can be used to support the budgeting process. Finally, applying this methodology to establish and track the value-added of an Information Technology solution in a process provides leaders the ability to make sound investment decisions.

B. RECOMMENDATIONS TO THE U.S. MARINE CORPS

I say transforming because transformation is less a destination and more of a journey. We have to shorten every process we have. The people at the top get it and the troops get it as well. They know things go too slow with too many people chopping on things that go through this place. It is the middle level that is the last to get it. I am encouraged that we have good support at the top and good support at the bottom. So it is kind of the middle that we are encircling right now. (Rumsfeld 2003, February)

The 2004 National Military Strategy declares,

The Armed Forces must remain ready to fight even as they transform and transform even as they fight. Adopting an "in-stride" approach to transformation – through rapid prototyping, field experimentation, organizational redesign and concept development – will ensure U.S. military superiority remains unmatched. Such an approach requires effective balancing of resources.

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In the same vein, the Marine Corps Business Enterprise Strategic Plan supports DoD business transformation initiatives and emphasizes the business transformation concepts of Naval Power 21:

1. Implementing business initiatives rapidly to free resources for warfighting capability
2. Identifying and increasing resources available to grow and sustain core combat capabilities
3. Improving business practices to achieve end-to-end capabilities in the most economical manner
4. Divesting/disinvesting in legacy systems and platforms no longer integral to mission accomplishment
5. Eliminating non-core functions that unnecessarily compete for resources
6. Increasing scrutiny on current year fiscal operations
7. Examining critically and continually all aspects of the DON to determine how to reap efficiencies across all headquarters, acquisition, research, operating force, and field support activities

This body of research demonstrated the capability of the KVA methodology to seamlessly augment these concepts, respectively, by: (1) supporting CPI initiatives such as Value Stream Analysis and Lean Six Sigma, (2) increase resource optimization, (3) improving business practices through benchmark analysis, (4) identifying non-integral IT systems in support of processes, (5) uncovering processes which drain resources away from core functions, (6) providing immediate analysis at multiple levels of command to ensure fiscal prudence, and (7) examining quantitatively all processes which employ knowledge assets.

It is with the intent of supporting ongoing efforts that the following recommendations are made:

1: The Marine Corps would greatly benefit from increased education and awareness of the KVA methodology as a decision support tool. KVA classes would be a valuable asset to include in organizational and individual training plans. In addition to being relatively easy to learn and employ, there is no proprietary software required. This cost-effective solution is in keeping with the Marine Corps intent to avoid costly, proprietary legacy solutions.

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2: KVA provides a framework to fairly determine and allocate revenue value to knowledge assets by describing all outputs in common units. As such, the Marine Corps can use Return on Knowledge (ROK) as a reliable, standard measure of value for qualitative processes that require a quantitative measurement of value, especially those in support of Lean Six Sigma initiatives.

3: This research brought to light that data collection was less complex using learning time statistics. Should the Marine Corps adopt the KVA principles, it would be beneficial for benchmarking purposes to develop a standard learning time repository for core processes. In addition, for those processes which emulate the private sector, the repository would be an ideal location to capture market comparable learning times and costs for more detailed KVA analyses.

4: As discussed throughout this research, KVA can be scaled to suit the perspective of any level of command, from supervisors in charge of a few individuals all the way to service-wide processes. A KVA Program implementation would be more effective if designed with scalability in mind, much like the Global Command and Control System (GCCS) provides simultaneous, real-time battlefield data to commanders and every level and location.

5: Many commands across the Marine Corps use Strategic Plans and maintain local balanced scorecards to monitor command performance in pursuit of goals and objectives. KVA can generate meaningful performance metrics for balanced scorecards and help leadership make better technology investment decisions.

C. FOLLOW-ON RESEARCH POTENTIAL

> Like most assets, knowledge is only valuable if it can be transmuted in goods and services that people will pay for. Here we get into leveraging knowledge, looking at adding value through its development. Here we move into new areas of knowledge networking and knowledge utilities – people enriching the knowledge asset through collaborative work. (Skyrme, 1997)

Throughout the course of this research, the scope needed to be held to a manageable limit. However, many questions arose that would make ideal springboards for future research, including:

- "How can the point of diminishing returns be established on performance measurement techniques such as KVA?"
- "When does data collection and analysis becomes more expensive than the savings it predicts?"
- "How do we know when we are done cutting fat before we start hitting the bone?"
- "How can IT be leveraged to improve the speed and accuracy of measuring organizational performance?"
- "With such a short refresh cycle for Information Technology these days, how can open source solutions be employed to reduce risk and ease the burden of upgrading technology?"
- "How can ever-changing priorities be incorporated into a performance measurement system to ensure only the important metrics are being tracked?"
- "What would an all-encompassing performance measurement system look like and how could KVA be programmed into it to provide dynamic, customizable reports on-demand?"

KVA may be able to provide statistical support to answer these and similar questions. This author challenges future graduate school students to critically consider these questions and to expand on the progress made on this paper.

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APPENDIX A: USMC BUSINESS POLICIES

- <u>31st Commandant of the Marine Corps, Gen Charles C. Krulak</u>: CMC White Letter 2-98 BETTER BUSINESS PRACTICES
- <u>32nd Commandant of the Marine Corps, Gen James L. Jones</u>: USMC Business Plan of 14 July 2000 and Establishment of Business Performance Offices at USMC Installations on 18 Apr 2002
- <u>33rd Commandant of the Marine Corps, Gen Michael W. Hagee</u>: CMC White Letter 6-04 TRANSFORMING OUR BUSINESS PROCESSES
- <u>34th Commandant of the Marine Corps, Gen James T. Conway</u>: MARADMIN 014/08 CONTINUOUS PROCESS IMPROVEMENT (CPI) IMPLEMENTATION POLICY (see below)

```
FM CMC WASHINGTON DC(UC)
TO AL MARADMIN(UC)
MARADMIN
R 071517Z JAN 08
UNCLAS
SUBJ:USMC CONTINUOUS PROCESS IMPROVEMENT (CPI) IMPLEMENTATION POLICY
MARADMIN 014/08
MSGID/GENADMIN/CMC WASHINGTON DC IL LR//
SUBJ/USMC CONTINUOUS PROCESS IMPROVEMENT (CPI) IMPLEMENTATION POLICY //
REF/A/MSGID:DOC/SECNAV/09OCT2007//
REF/B/MSGID:DOC/DUSD/11MAY2006//
REF/C/MSGID:DOC/SECNAV/03MAY2006//
REF/D/MSGID:MSG/CMC/141654ZDEC2006//
REF/E/MSGID:MSG/CMC/211203ZDEC2006//
REF/F/MSGID: USMC CPI GUIDEBOOK/-/21DEC2007//
NARR/REF A IS THE SECNAV/CMC/CNO MEMO ON DON OBJECTIVES FOR FY 2008 AND
BEYOND THAT CALLS FOR THE ACCELERATION OF LEAN SIX SIGMA (LSS)
INTEGRATION ACROSS THE DON IN ORDER TO DEVELOP A CULTURE OF CONTINUOUS
IMPROVEMENT.   REF B IS A DEPSECDEF MEMO ESTABLISHING DoD-WIDE CPI
PROGRAMS.  REF C IS A SECNAV MEMO ON TRANSFORMATION THROUGH LSS.  REF D
IS THE ACMC MSG DIRECTING THE USE OF INNOVATION AND CPI TOOLS TO
INCREASE COMBAT READINESS AND SUPPORT TO THE WARFIGHTER.   REF E
CONTAINS INITIAL CPI REPORTING REQUIREMENTS.   REF F IS A REFERENCE
DOCUMENT FOR CPI PRACTITIONERS AND CONTAINS THE CURRENT BODY OF
KNOWLEDGE AND TERMINOLOGY CONSISTENT WITH DoD AND DON CPI STANDARDS AND
GUIDANCE.   REF F PROVIDES THE BASIS FOR A SERIES OF FUTURE CPI
MARADMINS DURING FY08.//
POC/EISSINGER/GS15/UNIT:LR/-/TEL:DSN  225-5768/TEL:COMM  703  695-5768
/EMAIL:JOEL.EISSINGER@USMC.MIL//
GENTEXT/REMARKS/GENTEXT/REMARKS/
1.  THE REFS DIRECTED THE USE OF CPI TO IMPROVE COMBAT READINESS.  CPI
IS NOW BEING USED ACROSS THE MARINE CORPS WITH CONSIDERABLE SUCCESS.
THIS MESSAGE IS THE FIRST IN A SERIES OF MARADMINS THAT WILL PROVIDE
POLICY AND GUIDANCE FOR THE APPLICATION OF CPI IN THE MARINE CORPS
PENDING PUBLICATION OF A MARINE CORPS ORDER ON CPI.
2.  STATUS
     A.  HIGH IMPACT CORE VALUE STREAMS (HICVS).  HICVS ARE STRATEGIC
PROCESSES THAT SUPPORT COMBAT READINESS AND THE WARFIGHTER.  THE MARINE
REQUIREMENTS OVERSIGHT COUNCIL (MROC) DESIGNATED NINE USMC HICVS.  THE
MROC ALSO DESIGNATED SENIOR LEADERS TO BE RESPONSIBLE FOR MANAGING,
COORDINATING, IMPROVING, AND REPORTING THE OVERALL PERFORMANCE OF THE
```

HICVS, EVEN THOUGH IT MAY CROSS ORGANIZATIONAL LINES. WORK HAS BEGUN TO DEFINE (OR "MAP") THE NINE HICVS, DEVELOP PRIORITIZED PLANS WITHIN EACH HICVS FOR IMPROVEMENT, AND INITIATE IMPROVEMENT PROJECTS. ACROSS THE USMC, OVER 200 IMPROVEMENT PROJECTS HAVE BEEN INITIATED AND 120 COMPLETED. RESULTS INCLUDE IMPROVED QUALITY OF LIFE AND SAFETY, REDUCED CYCLE TIME, REDUCED ERRORS OR REWORK, AND IMPROVED UTILIZATION OF USMC RESOURCES. THE NINE HICVS AND THEIR DESIGNATED LEADERS ARE:

HICVS:	HICVS LEADERS:
ACQUISITION	CG, MARCORSYSCOM
AVIATION MATERIAL LIFE CYCLE MGMT (AIRSPEED)	DC, AVN
CAPABILITY DEVELOPMENT	DC, CD&I
HUMAN RESOURCES DEVELOPMENT	DC, M&RA
INFORMATION TECHNOLOGY	DIR, C4/CIO
INSTALLATION MANAGEMENT	DC, I&L
RESOURCE ALLOCATION	DC, P&R
SERVICE ADVOCACY	DC, PP&O
TOTAL LIFE CYCLE MGMT (GROUND)	DC, I&L

B. TRAINING

(1) SENIOR LEADER TRAINING. SECNAV ESTABLISHED A GOAL TO PROVIDE CPI TRAINING TO 100 PERCENT OF FLAG/SES AND COL/GS-15 (NSPS EQUIVALENT) SENIOR LEADERS BY THE END OF CY07. MARINES IN JOINT ASSIGNMENTS ARE NOT INCLUDED IN THIS GOAL. ADDITIONALLY, OPERATIONAL FORCE BILLETS AT THE MEF OR LOWER ECHELON-LEVEL ARE EXCLUDED UNTIL SUCH TIME THAT CONTINGENCY REQUIREMENTS ALLOW FOR THEIR PARTICIPATION IN THIS CRITICAL IMPROVEMENT EFFORT. THE CURRENT STATUS IS 81 PERCENT TRAINED. COMMANDS WILL CONTINUE TO ACHIEVE AND MAINTAIN THE GOAL OF 100 PERCENT OF SENIOR LEADERS TRAINED AND REPORT STATUS AS PART OF MONTHLY REPORTING TO CMC (LR) DESCRIBED IN PARA 3B(5) BELOW.

(2) LEAN SIX SIGMA BLACK BELT AND GREEN BELT TRAINING. SECDEF AND SECNAV ALSO ESTABLISHED GOALS FOR A PERCENTAGE OF THE AFFECTED WORKFORCE TO RECEIVE LSS BLACK BELT OR GREEN BELT TRAINING. THIS GOAL IS INTENDED TO MAKE ORGANIZATIONS SELF-SUSTAINING IN CPI/LSS AND TO ENSURE TRAINING IS CONDUCTED IAW DON STANDARDS. A FORTHCOMING MARADMIN WILL PROVIDE ADDITIONAL INFORMATION ABOUT CPI TRAINING, CERTIFICATION, AND THE AFFECTED WORKFORCE GOALS. ONE IMPORTANT TRAINING REQUIREMENT IS THAT CPI PROJECTS MUST BE ASSIGNED TO INDIVIDUALS BEFORE BLACK OR GREEN BELT TRAINING COMMENCES. THE UTILIZATION OF THESE TRAINED BLACK AND GREEN BELTS AND THE STATUS OF THEIR ASSIGNED PROJECTS IS REPORTED TO SECNAV ON A MONTHLY BASIS AND IS AN INDICATOR OF USMC SUCCESS IN IMPROVING SUPPORT TO THE WARFIGHTER. WE CURRENTLY HAVE 50 BLACK BELTS AND 179 GREEN BELTS TRAINED.

(3) TRAINING REQUESTS FOR USMC SPONSORED CPI/LSS TRAINING CAN BE MADE THROUGH THE CHAIN OF COMMAND TO CMC (LR). A LIST OF SCHEDULED CLASSES WITH LOCATION IS AVAILABLE AT THE LR WEB SITE (FROM THE HQMC WEBSITE (WWW.HQMC.USMC.MIL), SELECT 'INSTALLATIONS AND LOGISTICS DEPARTMENT,'THEN SELECT 'DIVISIONS,' THEN SELECT 'LR, MC BUSINESS ENTERPRISE OFFICE').

3. ACTIONS

A. THE MROC HAS CPI OVERSIGHT RESPONSIBILITY.

B. HICVS LEADERS, MARFOR (COM, PAC, RES) COMMANDERS, AND CGS, MARCORLOGCOM AND MARCORSYSCOM WILL:

(1) USE CPI TO IMPROVE COMBAT READINESS AND WARFIGHTING CAPABILITY.

(2) CONDUCT ANALYSIS OF RESPECTIVE PROCESSES, IDENTIFY AND PRIORITIZE HIGH-IMPACT CPI PROJECTS THAT IMPROVE COMBAT READINESS, AND APPLY CPI STANDARD METHODS TO EXECUTE PROJECTS.

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(3) DESIGNATE A COLONEL/GS-15 (OR NSPS EQUIVALENT) TO SERVE AS ORGANIZATIONAL CPI CHAMPION WHO WILL LEAD THE DEVELOPMENT OF AN ORGANIZATIONAL CPI PROGRAM THAT ENSURES A TAILORED, SELF-SUFFICIENT CPI CAPABILITY. THEY WILL ALSO PARTICIPATE IN THE MARINE CORPS CPI WORKING GROUP ESTABLISHED IN REF D TO COORDINATE CPI IMPLEMENTATION ACROSS THE CORPS.

(4) ENSURE TRAINING IS ACCOMPLISHED AS DIRECTED IN THIS MARADMIN, THE REFERENCES, AND THE GUIDANCE CONTAINED IN THE CPI GUIDEBOOK.

(5) REPORT CPI RESULTS (PER REF E) TO CMC (LR) NLT THE LAST WORKING DAY OF EACH MONTH TO INFORM THE MROC AND TO SUPPORT MONTHLY SECNAV BRIEFINGS BY THE DIRECTOR, MARINE CORPS STAFF (DMCS).

C. THE DC, P&R WILL:

(1) LEAD THE RESOURCE ALLOCATION HICVS.

(2) ASSIST DC, I&L TO RESOURCE THE CPI EFFORT.

D. THE DC, AVN WILL:

(1) LEAD PROCESS IMPROVEMENT EFFORTS IN THE USMC AVN MATERIEL LIFE CYCLE MANAGEMENT (MLCM) HICVS.

(2) COORDINATE AS APPROPRIATE WITH THE NAVAIR AIRSPEED PROGRAM AND DC, I&L TO ENSURE MAXIMUM ALIGNMENT OF PROCESS IMPROVEMENT CONCEPTS AND METHODOLOGIES.

E. THE DC, CD&I WILL:

(1) LEAD THE CAPABILITY DEVELOPMENT, OR EXPEDITIONARY FORCE DEVELOPMENT SYSTEM, HICVS.

(2) ASSIST ORGANIZATIONS IN FORMALLY ESTABLISHING APPROPRIATE BILLET STRUCTURE FOR CPI ACTIVITIES WITH THE ASSISTANCE OF DC, I&L, HICVS LEADERS, MARFOR COMMANDERS, AND CGS MARCORLOGCOM AND MARCORSYSCOM.

(3) ASSIST DC, I&L TO INCORPORATE CPI KNOWLEDGE INTO TRAINING AND EDUCATION.

F. THE DC, M&RA WILL:

(1) LEAD USMC HUMAN RESOURCES DEVELOPMENT HICVS.

(2) COORDINATE WITH DC, P&R; DC, CD&I; CG, MCRC; DON CIVILIAN HUMAN RESOURCE OFFICE (CHRO); AND DIR, AR DIV TO ENSURE THESE EFFORTS ARE ALIGNED WITH THE USMC HUMAN RESOURCES DEVELOPMENT HICVS.

G. THE DC, I&L WILL:

(1) LEAD THE TOTAL LIFE CYCLE MANAGEMENT (TLCM) AND INSTALLATION MANAGEMENT HICVS.

(2) ENSURE MROC IS INFORMED OF CPI PROGRESS AND ASSEMBLE MONTHLY CPI REPORTS IN SUPPORT OF SECNAV UPDATES BY ACMC AND DMCS.

(3) ISSUE APPROPRIATE CPI IMPLEMENTING POLICY AND, WITH SUPPORT FROM DC, P&R, PROVIDE CPI SUPPORT PROGRAMMING OVERSIGHT FOR IMPLEMENTING ORGANIZATIONS.

(4) APPOINT THE DIRECTOR, MARINE CORPS BUSINESS ENTERPRISE OFFICE (MCBEO), TO LEAD THE USMC CPI EFFORTS, PROVIDE CPI FUNCTIONAL OVERSIGHT, AND CHAIR THE MARINE CORPS CPI WORKING GROUP.

(5) ESTABLISH REGIONAL CPI SUPPORT TEAMS MANNED WITH CPI BLACK BELTS AND MASTER BLACK BELTS. BASED ON THEIR STRATEGIC POSITIONING THROUGHOUT THE CORPS, CPI SUPPORT TEAMS WILL ASSIST SUPPORTED COMMANDERS AND HICVS LEADERS WITH IMPLEMENTATION AND EXECUTION OF A TAILORED, SELF-SUFFICIENT CPI CAPABILITY. WHILE DC, I&L RETAINS FULL AUTHORITY AND FINANCIAL/NSPS SUPPORT RESPONSIBILITIES OVER CPI SUPPORT TEAMS, THEIR EFFECTIVENESS IS WHOLLY DEPENDENT ON THE USE OF THE SUPPORTED COMMAND'S AUTHORITY. THUS, SUPPORTED/SUPPORTING COMMAND RELATIONSHIPS MUST BE ESTABLISHED BASED ON THE UNIQUE REQUIREMENTS ASSOCIATED WITH THEIR STRATEGIC POSITIONING AND THE NEEDS OF THE SUPPORTED COMMANDER OR HICVS LEADER. SUPPORTED MARFOR COMMANDERS AND HICVS LEADERS WILL ASSIST DC, I&L TO REFINE THE REQUIREMENTS (NUMBER,

LOCATION, SIZE) AND SUPPORT COMMAND AUTHORITY REQUIREMENTS FOR REGIONAL CPI SUPPORT TEAMS THROUGH THE MARINE CORPS CPI WORKING GROUP.

(6) ENSURE CPI SUPPORT TEAMS POSSESS EXPERTISE AND CAPABILITY TO PROVIDE SUPPORTED ORGANIZATIONAL LEADERS WITH ASSISTANCE/ADVICE IN THE FOLLOWING AREAS: CPI PROGRAM DEVELOPMENT; HIGH-LEVEL PROCESS MAPPING; PROJECT DEVELOPMENT, PRIORITIZATION, AND EXECUTION; CPI PROGRAM LESSONS RETRIEVAL/COLLECTION/SHARING; AND, CPI MENTORSHIP AND TRAINING.

H. THE CG, MARCORLOGCOM WILL:

(1) CONTINUE TO ACCELERATE IMPLEMENTATION OF CPI THROUGHOUT LOGCOM.

(2) SUPPORT THE DC, I&L ROLE TO LEAD THE TLCM HICVS.

(3) COORDINATE AS APPROPRIATE WITH THE DC, I&L TO ENSURE MAXIMUM ALIGNMENT OF PROCESS IMPROVEMENT CONCEPTS AND METHODOLOGIES ACROSS THE MARINE CORPS.

I. THE CG, MARCORSYSCOM, WILL LEAD THE ACQUISITION HICVS.

J. THE DIRECTOR, C4, WILL LEAD THE INFORMATION TECHNOLOGY HICVS.

K. THE MARINE CORPS CPI WORKING GROUP WILL:

(1) REPRESENT EACH HICVS LEADER, MARFOR COMMANDER, AND THE CGS OF MARCORLOGCOM AND MARCORSYSCOM AT THE COLONEL/GS-15 (OR NSPS EQUIVALENT) LEVEL.

(2) SUPPORT DEVELOPMENT OF CPI POLICY AND TIMELY RESULTS REPORTING.

(3) SUPPORT EFFECTIVE CPI IMPLEMENTATION INCLUDING ISSUES THAT CROSS FUNCTIONAL AREAS, ORGANIZATIONS, AND HICVS.

(4) FACILITATE EFFECTIVE CPI IMPLEMENTATION AND GOVERNANCE.

4. CPI INFORMATION TECHNOLOGY (IT) SUPPORT.

A. IN COOPERATION WITH NAVAIR, AN AUTOMATED CPI MANAGEMENT SYSTEM (CPIMS) TO FACILITATE CPI TRAINING, PROJECT MANAGEMENT, AND REPORTING IS CURRENTLY BEING PILOTED. FULL IMPLEMENTATION IS PLANNED DURING FY08. INTERIM REPORTING GUIDANCE (REF E) IS BEING MODIFIED TO BETTER SUPPORT THE TRANSITION TO CPIMS AND WILL BE PROMULGATED IN AN UPCOMING MESSAGE.

B. THE USMC HAS PURCHASED LICENSES FOR THE CPI SUPPORT TOOLS "MINITAB" AND "IGRAFX PROCESS FOR SIX SIGMA" TO SUPPORT PROCESS ANALYSIS. DISTRIBUTION INSTRUCTIONS PERTAINING TO THESE IT SUPPORT TOOLS WILL BE PROVIDED DURING THE 2D QTR FY08.

5. CPI GUIDEBOOK. VERSION 1.0 IS LOCATED AT THE LR WEB SITE (FROM THE HQMC WEBSITE (WWW.HQMC.USMC.MIL), SELECT 'INSTALLATIONS AND LOGISTICS DEPARTMENT,' THEN SELECT 'DIVISIONS,' THEN SELECT 'LR, MC BUSINESS ENTERPRISE OFFICE').

6. FURTHER INFORMATION ON CPI CAN BE OBTAINED BY CONTACTING MCBEO, HQMC (LR) AT 703-695-5768, EMAIL CPI.PROGRAM.OFFICE@USMC.MIL.

7. RELEASE AUTHORIZED BY LTGEN R. S. KRAMLICH, DIRECTOR, MARINE CORPS STAFF.//

APPENDIX B: KVA-RELATED RESEARCH

Adler, Jameson R. and Ahart, Jennifer L., *AEGIS Platforms: Using KVA Analysis to Assess Open Architecture in Sustaining Engineering.* Masters Thesis, Systems Technology Department, Naval Postgraduate School, Jun 2007.

Baxter, Jr., Joseph L. and Campbell, Jr., Errol A., *Increasing the Capacity of a Knowledge Intensive Process Through the Use of Process Reengineering and Knowledge-Value Added Methodologies.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Jun 2003.

Bourazanis, Petros and Gusnadi, *Valuing the DoD Process Output.* MBA Professional Report, Naval Postgraduate School, Dec 2005.

Buckley, Charles B., *An Analysis of Management Techniques and Their Impact on the Marine Corps in a Navy Marine Corps Intranet Environment.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Jun 2006.

Carter, Timothy R. and Pitts, Michael M., *Knowledge Value Added as a Methodology to Evaluate the Office of Force Transformation's WOLF-PAC/Stiletto Program Concepts.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Sep 2006.

Cash, Eugene S., Jackson, David W., and Means, Floyd, *Estimating the ROI on an ERP for Naval Aviation Operations Using Market Comparables.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Sep 2006.

Clapp, Hubert N. and Lambeth III, Ira D., *Using Knowledge Value Added (KVA) for Evaluating Cryptologic IT Capabilities: Trial Implementation.* Masters Thesis, Information Systems Warfare Department, Naval Postgraduate School, Sep 2007.

Cook, Glenn R. and Dyer, Jefferson D., *Business Process Reengineering with Knowledge Value Added in Support of The Department of the Navy Chief Information Officer.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Sep 2003.

Cornelius, Jr., D. (2007). The use of collaborative and three-dimensional imaging technology to achieve increased value and efficiency in the cost estimation portion of the shipmain environment. (Master's thesis, Naval Postgraduate School, Sep 2007).

Goodson, Christopher J., Knutson, Richard D., *Portfolio Management Decision Support Tools Analysis Relating to Management Value Metrics.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Mar 2007.

Graves, Gwendolyn M., *The United States Navy Reserve Component's Account Management Challenge in a Navy Marine Corps Intranet Environment.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Sep 2005.

Hutchins, Susan G., et al., *Impact of Naturalistic Decision Support on Tactical Situation Awareness.* Technical Report, Naval Postgraduate School, Monterey, CA, Feb 2000.

Jacoby, Grant A., *A Metric Model for Intranet Portal Business Requirements.* Dissertation, Computer Science Department, Naval Postgraduate School, Dec 2003.

Komoroski, Christine L., *A Methodology for Improving the Shipyard Planning Process Using KVA Analysis, Risk Simulation and Strategic Real Options.* Research Paper, Naval Postgraduate School, 30 Sep 2006.

Komoroski, Christine L., *Reducing Cycle Time and Increasing Value Through the Application of Knowledge Value Added Methodology to the U.S. Navy Shipyard Planning Process.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Dec 2005.

Kovats, Keith E., *Assessing the Potential Value of FORCENet Technologies within the JFMCC Planning Process Using the Knowledge Value Added Methodology.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Jun 2006.

Layne, Sylvia M., *Business Process Re-engineering (BPR) of the Navy's Information Professional (IP) Community's Continuing Education Unit (CEU) Tracking Process.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Mar 2006.

Middleton, Michael W., *Assessing the Value of the Joint Rapid Acquisition Cell.* Masters of Business Administration, Graduate School of Business and Public Policy, Naval Postgraduate School, Dec 2006.

Morris, Gary L., *Battle Group Ordnance and Fuel Logistic task Measures of Performance for the Universal Naval Task List.* Masters Thesis, Operations Research Department, Naval Postgraduate School, Sep 1998.

70

Neises, Glen E., *Personnel Identity Management and the Expeditionary Strike Group.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Sep 2007.

O'Connor, Maureen J. and Patillo, Paul L., *Reengineering Human Performance and Fatigue Research Through the Use of Physiological Monitoring Devices, Web-based and Mobile Device Data Collection Methods, and Integrated Data Storage Techniques.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Dec 2003.

Rios, Jr., Cesar G., *Return on Investment Analysis of Information Warfare Systems.* Masters Thesis, Systems Engineering Department, Naval Postgraduate School, Sep 2005.

Rios, Jr., Cesar G., et al., *Integrated Portfolio Analysis: Return on Investment and Real Options Analysis of Intelligence Information Systems (Cryptologic Carry On Program).* Research Paper, Naval Postgraduate School, 30 Sep 2006.

Seaman, Nathan L., *The Use of Collaborative and Three Dimensional Imaging Technology to Increase the Value in the Shipmain Environment of the Fleet Modernization Plan.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Jun 2007.

Uchytil, Joseph, et al., *AEGIS and Ship Self-Defense System (SSDS) Platforms: Using KVA Analysis, Risk Simulation and Strategic Real Options to Assess Operational Effectiveness.* Research Paper, Naval Postgraduate School, 30 Sep 2006.

Unknown. "Process Valuation & Portfolio Management for Capabilities Based Planning - Introduction to Knowledge Valuation Analysis (KVA)." Working Paper, Naval Postgraduate School, Sep 2004.

Vuillemot, Andrew J., *Data Warehousing at the Marine Corps Institute.* Masters Thesis, Information Technology Management Department, Naval Postgraduate School, Sep 2003.

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APPENDIX C: FORMAL TRAINING DAYS PER TASK

Task	MOS	Course Title	Rank	Days
911 dispatch	5811 Basic Military Police	High Risk Personnel	E3	6
911 dispatch	5819 Military Police Investigator	Crisis/Hostage Negotiation	E5	10
911 dispatch	5821 Criminal Investigator CID Agent	Crisis/Hostage Negotiation	E5	10
Accident investigations/reconstruction	5813 Accident Investigator	Traffic Reconstruction	E5	10
Adjudged Confinement	5831 Correctional Specialist	Naval Corrections Academy	E1	29
Animal Control	5811 Basic Military Police	Military Working Dog Handler Course	E1	55
Conduct complete investigation on assumable cases	5819 Military Police Investigator	Military Police Investigator Course	E4	40
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	Apprentice CID Special Agent Course	E5	75
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	CID Certification	E5	12
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	Scientific Content Analysis	E5	4
Conduct complete investigation on assumable cases	5811 Basic Military Police	FBI National Academy	E6	76
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	FBI National Academy	E6	76
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	Forensic PDD Refresher	E6	20
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	Forensics in a Windows Environment	E6	10
Conduct complete investigation on assumable cases	5821 Criminal Investigator CID Agent	Seized Computer Recovery Specialist	E6	10
Conduct complete investigation on assumable cases	5822 Polygraph Examiner	Forensic PDD (Polygraph) Program	E6	60
Conduct complete investigation on assumable cases	5822 Polygraph Examiner	Senior Examiner Course	E7	5
Conduct preliminary investigation on referable cases	5811 Basic Military Police	Street Gangs Identification and Investigation	E4	5
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Street Gangs Identification and Investigation	E4	5
Conduct preliminary investigation on referable cases	5819 Military Police Investigator	REID Techniques of Interview and Interrogation	E5	3
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Practical Kinesic Interview & Interrogations	E5	5
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	REID Techniques of Interview and Interrogation	E5	3
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Sexual Assault Investigations Training	E5	5
Conduct preliminary investigation on referable cases	5811 Basic Military Police	Intelligence In Combating Terrorism	E6	10
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Advanced Crime Scene Investigative Techniques	E6	9
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Advanced Fraud Investigations	E6	10
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Computer Incident Response Course	E6	10
Conduct preliminary investigation on referable cases	5821 Criminal Investigator CID Agent	Introduction to Computer Networks & Computer Hardware	E6	10
Conduct preliminary investigation on referable cases	5822 Polygraph Examiner	Advanced Polygraph Studies Program	E7	10
Conduct preliminary investigation on referable cases	5822 Polygraph Examiner	Polygraph Countermeasures	E7	5
Conduct preliminary investigation on referable cases	5822 Polygraph Examiner	PDD Managers Course	E8	5
Correctional Custody Unit	5832 Correctional Counselor	Correctional Counselor	E4	25
Crime Prevention/Physical Security	5811 Basic Military Police	Child Abuse Prevention Investigative Techniques	E3	8
Crime Prevention/Physical Security	5814 Physical Security Specialist	Conventional Physical Security Course	E3	10
Crime Prevention/Physical Security	5814 Physical Security Specialist	Crime Prevention Techniques and Programs	E3	10
Crime Prevention/Physical Security	5821 Criminal Investigator CID Agent	Child Abuse Prevention Investigative Techniques	E3	8
Crime Prevention/Physical Security	5821 Criminal Investigator CID Agent	Crime Prevention Techniques and Programs	E3	10
Customs operations	5811 Basic Military Police	Military Police Basic Course	E1	8
Drug Detection	5811 Basic Military Police	Military Police Basic Course	E1	8
Emergency Response	5811 Basic Military Police	Individual Terrorism Awareness Course	E1	5
Emergency Response	5811 Basic Military Police	Interservice Nonlethal Individual Weapons Instructor Course (INIWIC)	E4	10
Emergency Response	5816 Special Reaction Team Member	Dynamic Entry Basic Course	E4	10
Emergency Response	5811 Basic Military Police	Anti-Terrorism Instructor Qualification Course (For Level I Brief Instructors)	E6	10
Emergency Response	5811 Basic Military Police	Anti-Terrorism Officer (ATO) (Naval Unit Advisor Specific)	E6	5
Emergency Response	5811 Basic Military Police	Anti-Terrorism Program Manager (Unit Advisors & Program Managers)	E6	5
Emergency Response	5811 Basic Military Police	Dynamics of International Terrorism	E6	5
Emergency Response	5821 Criminal Investigator CID Agent	Anti-Terrorism Officer (ATO) (Naval Unit Advisor Specific)	E6	5
Emergency Response	5821 Criminal Investigator CID Agent	Anti-Terrorism Program Manager	E6	5
Emergency Response	5821 Criminal Investigator CID Agent	Dynamics of International Terrorism	E6	5
Explosive Detection	5811 Basic Military Police	Military Police Basic Course	E1	8
Flight Line Security	5811 Basic Military Police	Military Police Basic Course	E1	8
Game Warden services	5811 Basic Military Police	Military Police Basic Course	E1	8
Installation access control	5811 Basic Military Police	Military Police Basic Course	E1	8
Intrusion Detection System monitoring	5814 Physical Security Specialist	Electronic Surveillance Systems and Administrative Design Course	E4	10
MP patrols	5811 Basic Military Police	Military Police Basic Course	E1	8
MWD law enforcement/security patrols	5811 Basic Military Police	Air Mobility Command Phoenix Raven Program	E1	14
MWD law enforcement/security patrols	5812 Working Dog Handler	Military Working Dog Phoenix Readiness Course	E1	15
MWD law enforcement/security patrols	5816 Special Reaction Team Member	Air Mobility Command Phoenix Raven Program	E1	14
MWD law enforcement/security patrols	5812 Working Dog Handler	Military Working Dog Supervisor Course	E3	20
Non-emergency patrol police services	5811 Basic Military Police	Domestic Violence Intervention Training	E3	5
Non-emergency patrol police services	5821 Criminal Investigator CID Agent	Domestic Violence Intervention Training	E3	5
Non-emergency patrol police services	5821 Criminal Investigator CID Agent	WMD/CBNRE Crime Scene Processing	E6	10
Non-law enforcement action	5811 Basic Military Police	Management of Small Law Enforcement Agency	E7	5
Non-law enforcement action	5811 Basic Military Police	Leadership Team Awareness Course	E8	5
Non-law enforcement action	5821 Criminal Investigator CID Agent	Management of Small Law Enforcement Agency	E7	5
Pass Issued	5811 Basic Military Police	Military Police Basic Course	E1	7
Police records/reports	5811 Basic Military Police	Narcotic Identification and Investigation	E4	5
Police records/reports	5821 Criminal Investigator CID Agent	Narcotic Identification and Investigation	E4	5
Police records/reports	5822 Polygraph Examiner	Law Enforcement Quality Control	E7	5
Pretrial Confinement	5831 Correctional Specialist	Enemy Detainee Operations Course (EDOC)	E1	10
Protective Service Operations	5811 Basic Military Police	Protective Services Training & Antiterrorism Driving Course	E4	15
Protective Service Operations	5821 Criminal Investigator CID Agent	Protective Services Training & Antiterrorism Driving Course	E4	15
SRT emergency response	5816 Special Reaction Team Member	Special Reaction Team/Marksman Observer Course	E3	10
SRT security details	5811 Basic Military Police	Smith & Wesson Defensive Tactics Instructor Course	E4	5
Traffic Court/Board liaison	5822 Polygraph Examiner	Fundamentals of Courtroom Testimony	E6	5
Traffic warning/ticket issued	5813 Accident Investigator	Traffic Management and Accident Investigation	E4	17

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LIST OF REFERENCES

ABC Model (2005). Financial and human resource data collected electronically by Marine Corps installations. Received Mar 2008 via a series of personal communications from the Marine Corps Business Enterprise Office.

ABC Model Standards (2004). Internal standard operating procedures for the Marine Corps Business Performance Office community, published electronically via e-mail circa Aug 2003.

ABC Model Standards (2005). Internal standard operating procedures for the Marine Corps Business Performance Office community, published electronically via e-mail circa Aug 2004.

Budget of the U.S. Government (2002). Office of Management and Budget Glossary. Retrieved June 03, 2008 from: http://www.whitehouse.gov/omb/budget/fy2002/guidegl.html.

CMC White Letter 06-04. "Transforming our business processes." Personal communication from the Commandant of the Marine Corps.

CMC White Letter 2-98. "Better business practices." Personal communication from the Commandant of the Marine Corps.

Conway, J., Roughead, G. and Winter, D. (2007). Department of the Navy objectives for 2008. Official memorandum. Washington, DC.

Defense Installations Strategic Plan (2007). [Electronic version]. Retrieved Jan 11, 2008 from:http://www.acq.osd.mil/ie/download/DISP2007_final.pdf.

DoD CPI Guidebook (May 2006). Continuous process improvement Transformation guidebook. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.army.mil/ArmyBTKC/docs/DoD%20CPI%20Trans%20 Guidebook.pdf.

Federal Accounting Standards Advisory Board (1995). "Managerial Cost Accounting Concepts and Standards for the Federal Government." Retrieved June 3, 2008 from: http://www.fasab.gov/pdffiles/sffas-4.pdf.

Feinberg, J. (June 29, 2006). "Benchmarking and best practice - utilization rates." [Electronic version]. Retrieved Feb 3, 2008 from: http://www.buzzle.com/editorials/6-29-2006-100771.asp.

GAO (1991). "The Chief Financial Officers Act: A Mandate for Federal Financial Management Reform." Preface. Retrieved June 3, 2008 from: http://www.gao.gov/special.pubs/af12194.pdf.

GAO Reports (1995-2007). Retrieved Dec 21, 2007, from: http://www.gpoaccess.gov/gaoreports/index.html.

Hagee, M., Mullen, M. and Winter, D. (2006, Feb). Department of the Navy objectives for 2006. Official memorandum. Washington, DC.

Hagee, M., Mullen, M. and Winter, D. (2006, Aug). Department of the Navy objectives for 2007. Official memorandum. Washington, DC.

Hammer, M. (2007). The 7 deadly sins of performance measurement [and how to avoid them]. *MIT Sloan Management Review.* pp. 19-28.

Housel, T. (2005). "Where to Invest in Information Systems: A CRM Case Study." Proceedings of the 38th Annual Hawaii International Conference on System Sciences, 2005. HICSS '05.

HQMC Action Memo (14 July 05). "Establishment of Marine Corps Installations East/West Sub-Regional Commands East and West and Disestablishment of Marine Corps Airbases East and West."

Kane, H.C.M. (Mar 2003). "Reframing the knowledge debate, with a little help from the Greeks." Electronic Journal of Knowledge Management 1:1, Paper 4, pp. 1-9; Retrieved Oct 10, 2006 from: http://www.ejkm.com/volume-1/volume1-issue1/issue1-art4.htm.

Leonard, D. (1998). "Wellsprings of Knowledge: building and sustaining the sources of innovation." Harvard Business School Press, Boston, MA.

LeValley, M. & Fairclough, L. (Jul-Sep 2007) Transformation Through Lean Six Sigma. *Department of the Navy, Chief Information Officer*. Retrieved Aug 17, 2007, from online article: http://www.chips.navy.mil/archives/07_Sep/PDF/Six_Sigma.pdf.

MARADMIN 320/03 (2003). Official USMC internal administrative message. Unclassified. Retrieved July 10, 2007 from: http://www.marines.mil/news/messages/Pages/2003Maradmins.aspx#.

Marine Corps Business Enterprise Strategic Plan (Nov 2004). [Electronic version]. Retrieved Jan 11, 2008 from: http://hqinet001.hqmc.usmc.mil/i%26L/v2/Depts.htm.

Marine Corps Installations Strategic Plan (2004). [Electronic version]. Retrieved Jan 11, 2008 from: http://hqinet001.hqmc.usmc.mil/i&l/v2/LF/MC%20ISP%202004.pdf.

Marine Corps Strategy 21 (Nov 2000). [Electronic version]. Retrieved Jan 11, 2008 from: http://www.dtic.mil/jointvision/strategy.pdf.

MCO 10570.1A (1990). DoD military working dog (MWD) program. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 1510.86B (2000). Individual training standards system for the military police and corrections occupational field (OCCFD) 58. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 1630.4A (1991). Law enforcement and physical security activities. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 1640.6 (2001). Marine Corps corrections program. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 5500.14A (1996). Flight line security program. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 5500.6F (1995). Arming of security and law enforcement personnel and the use of force. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 5500.18 (1993). Crime prevention. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 5510.15A (1993). Security of Marine Corps installations and resources. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO 5530.14 (2000). Marine Corps physical security program manual. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_mco.aspx.

MCO P1640.4C (1999). Marine Corps correctional custody manual (CCM). [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_p.aspx.

MCO P5580.2A (1998). Marine Corps law enforcement manual. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.marines.mil/news/publications/Pages/order_type_p.aspx.

MID 901 (Dec 2002). Department of Defense Management Initiative Decision (FOUO).

MID 910 (Dec 2002). Department of Defense Management Initiative Decision (FOUO).

National Military Strategy of the United States (2004). [Electronic version]. Retrieved Jan 11, 2008 from: http://www.defenselink.mil/news/Mar2005/d20050318nms.pdf.

National Security Strategy of the United States (2002). [Electronic version]. Retrieved Jan 11, 2008 from: http://www.whitehouse.gov/nsc/nss.pdf.

National Partnership for Reinventing Government. Retrieved June 3, 2008 from: http://govinfo.library.unt.edu/npr/library/misc/s20.html.

Naval Power 21 (2002). Navy-Marine Corps joint vision document for the 21st century. [Electronic version]. Retrieved Jan 11, 2008 from: http://www.navy.mil/navydata/people/secnav/england/navpow21.pdf.

Office of Force Transformation (n.d.). Transformation Trends library. Retrieved June 3, 2008 from: http://www.oft.osd.mil/library/library.cfm?libcol=9.

Official ACMC Message (Apr 2002). "Establishment of Business Performance Offices at USMC Installations." Unclassified message ID R181715ZAPR02.

Porter, J. (Mar 24, 2008). Even the brass is hitting the books." *Business Week.* Issue 8-12. Retrieved Apr 7, 2008 from: http://www.businessweek.com/magazine/content/08_12/b4076078843382.htm.

Quadrennial Defense Review Report (Feb 6, 2006). [Electronic version]. Retrieved Jan 11, 2008 from: http://www.defenselink.mil/pubs/pdfs/QDR20060203.pdf.

Rumsfeld, D. (2003, Apr). DoD transformation planning guidance. Washington, DC. [Electronic version]. Retrieved Jan 17, 2008 from: http://www.defenselink.mil/brac/docs/transformationplanningapr03.pdf.

Rumsfeld, D. (2003, Feb). Office of Force Transformation. [Electronic version]. *Transformation Trends.* Retrieved May 30, 2008 from: http://www.oft.osd.mil/library/library.cfm?libcol=9.

Saturno, J.V. (1998). CRS Report to Congress. "The Budget Enforcement Act: Its Operation Under a Budget Surplus." Retrieved June 3, 2008 from: http://www.rules.house.gov/Archives/98-97.htm.

Six Sigma Systems, Inc. (n.d.) Retrieved June 4, 2008 from: http://www.sixsigmasystems.com/index.htm.

Skyrme, D. (Mar 1997). "I3 UPDATE No. 17." Retrieved Feb 9, 2008 from: http://www.skyrme.com/insights/11kasset.htm.

Tennant, Geoff (2001). SIX SIGMA: SPC and TQM in manufacturing and services. Gower Publishing, Ltd., p. 25.

U.S. Department of Education (n.d.). Clinger-Cohen Act. Retrieved June 3, 2008 from: http://www.ed.gov/policy/gen/leg/cca.html.

U.S. Government (2001). President's Management Agenda, Frequently Asked Questions. Retrieved June 3, 2008 from: http://www.whitehouse.gov/results/agenda/faq.html.

Winter, D.C. (2006). Transformation through lean six sigma. DoN Memorandum. Retrieved Jan 11, 2008 from: https://acc.dau.mil/GetAttachment.aspx?id=140367&pname=file&lang=en-U.S.&aid=6113.

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